MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association and Minneapolis Surgical Society.

Vol. X FEBRUARY, 1927 No. 2

CHRONIC PANCREATITIS*

JOHN B. DEAVER, M.D.
Philadelphia

It is a well-established clinical fact that enlargement of the pancreas, especially the head of the gland, is a frequent accompaniment of cholecystitis. The frequency of this condition has been variously estimated and in a manner is dependent upon the personal factor, as expressed by the experience of the surgeon. Of course, it presupposes a knowledge of the size and palpatory characteristics of the normal gland, a knowledge gained by the habit of thorough abdominal exploration whenever the opportunity arises. The first lesson in surgical pathology and in the pathology of the living is the recognition of normal tissue. We believe it safe to say that careful and painstaking examination at operation for cholecystitis and common duct stone, by proper exposure with gentle but thorough palpation and inspection with the aid of the Cameron light, will reveal a surprisingly large incidence of pancreatitis and also the early stages of this condition presented in the regional lymphatics.

The first procedure in the examination is directed to the peri-ductal glands in relation with the cystic and common ducts. When only these glands are enlarged, the infectious inflammation is circumscribed and the prognosis against subsequent post-operative sequelæ is practically assured. In these circumstances simple removal of the infected gallbladder should suffice to accomplish a permanent cure. When the glands in the gastro-hepatic omentum adjacent to, and around the head of the pancreas are enlarged, the outlook is less promising, especially if they are resistant to the touch, thus indicating fibrotic change; while if the glands are still soft and impressionable to the touch, the curative effect of bile drainage is quite promising. I cannot stress the practical importance of these facts too strongly upon my medical friends who do not have the same opportunity of adjudging the condition as does the surgeon. Daily contact with these conditions at the operating table verifies the oft-quoted statement that the surgeon walks by

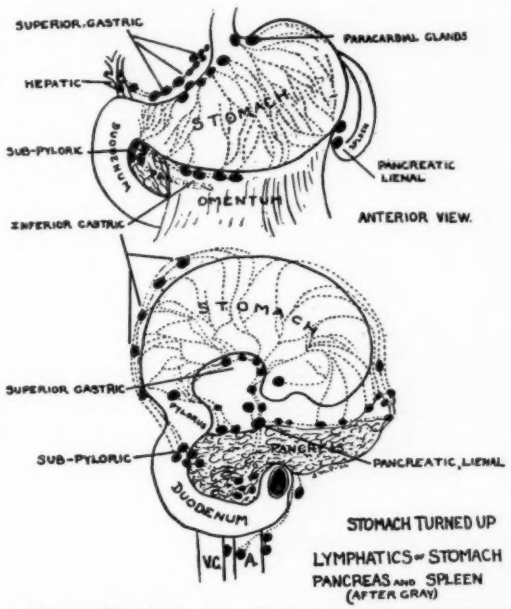


Fig. 1. Distribution of lymphatics in region of stomach and pancreas.

sight and touch and not by faith alone. When the process has advanced to the cirrhotic stage the damage is irreparable and the opportunity for the benefits of early operation is past. The responsibility for this state of affairs lies with those who have faith in medical measures, such as non-surgical biliary drainage, which not only fail to cure, but invite the hazards of serious complications. When the surgeon fails in the attempt miraculously to correct the faults of delay, the art of surgery is unjustly held accountable for the mistakes of an allied art.

There is lack of unanimity of opinion regarding the etiology of chronic pancreatitis. We

*Read before the Minneapolis Surgical Society, Minneapolis, December 2, 1926.

have persistently advocated our belief that the process begins as a lymphangitis from a focus of infection usually in the liver or the gall-bladder or both. There is a successive involvement of the lymph glands about the cystic and common ducts, the glands in the gastro-hepatic omentum,

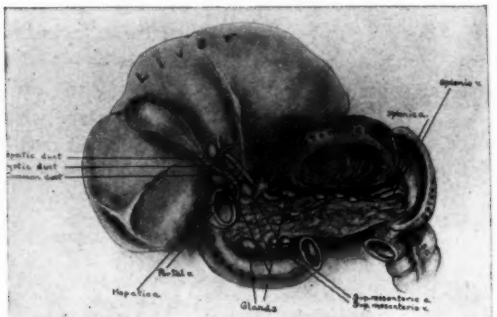


Fig. 2. Enlarged lymph nodes in region of pancreas.

down to the glands about the head of the pancreas and first portion of the duodenum, and finally into the interlobar and interlobular spaces of the pancreas itself. Thus we have cholecystitis, periductal lymphadenitis, peripancreatic lymphadenitis, pancreatic lymphangitis, pancreatitis, and cirrhosis of the pancreas. Our theory in this sequence of pathologic events is founded on a wide experience with the condition in all its stages. Sweet has shown that the head of the pancreas or the triangle of infection has a more intimate anatomic relationship with the biliary tract than has the body of the gland. It has been demonstrated by injection experiments that the lymphatics about the gallbladder and its ducts are in communication with those of the head of the pancreas and the first portion of the duodenum. The direction of lymphatic drainage may be influenced by inflammatory conditions and it is not uncommon to find a centrifugal lymphatic spread of infection as well as in the direction of the normal lymphatic flow.

We do not deny that there are other routes by which infection may and does reach the pancreas. Next in importance to the lymphatic route is direct extension by contiguity from the common duct to the pancreas. Burden has found that inflammatory reaction in the common duct is an almost constant accompaniment of cholecystitis, the reaction being particularly noticeable when there are stones in the duct. The common duct is always more or less completely surrounded by the pancreas so that infection in the duct wall may easily extend to the pancreas itself. We have noted in several instances of stone in the lower end of the common duct without jaundice that there was a mild subacute pancreatitis and evidence of fat necrosis. It may well be that in cases of acute pancreatitis presumably the result of the entrance of bile into the duct of Wirsung, made possible by a conveniently and nicely lodged stone, a factor more important than bile, may have been the extension of infection from the wall of the duct about the stone directly to the substance of the pancreas itself.

Fig. 3. Chronic interstitial pancreatitis.

It is possible also that infection may enter either the duct of Wirsung or the duct of Santorini and thus reach the pancreas. However, it has been shown that the lumen of a duct, in the absence of obstruction, is an improbable route for infection to become established in any gland. But the intrinsic and extrinsic lymphatics of a duct provide ready pathways for the extension of infection.

Mann and Giordano studied the bile factor in pancreatitis by making dissections of necropsy specimens and by experimental observations. They found that in only about 4.5 per cent of cases was it anatomically possible for a stone in the lower end of the common duct to cause bile to enter the pancreas; that the terminations of the two ducts were under the control of a common sphincter contraction which closed both ducts; and that bile injected into the pancreatic duct under the maximal pressure attained in any clinical condition failed to produce pancreatitis. They say, regarding the bile factor: "Our data conclusively prove that we must look elsewhere

for the explanation for the cause of most cases of pancreatitis."

The pancreas apparently enjoys considerable resistance to blood stream infection because it seems rarely to be affected in diseases which are characterized by a marked bacteremia. But that it is not entirely immune is evidenced by small discrete areas of focal necrosis and hemorrhage which are sometimes seen in the pancreas, capable of causing acute epigastric pain, collapse, etc., and simulating epigastric angina. Certain cases of ultra-acute pancreatitis, sudden in onset, like pulmonary embolism or peri-nephritic abscesses may be hematogenous in origin.

The liver and the pancreas have an intimate anatomic and physiologic relationship which also includes the gall bladder and the first portion of the duodenum. Disease of one of these organs is likely to affect other members of the group; a fact which is amply demonstrated in clinical experience. An example of such an effect is seen in the development of hepatic cirrhosis. This occurs essentially in two forms: a portal type,

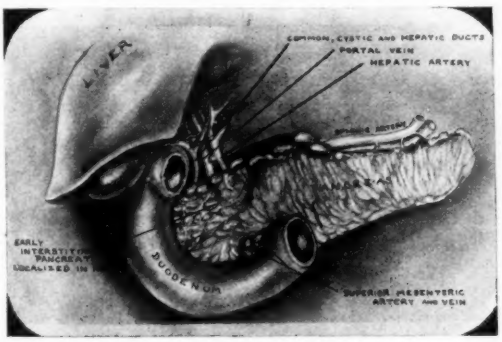


Fig. 4. Interstitial pancreatitis of the head.

the result of chemical toxic irritants carried to the liver from the intestinal tract; and a true biliary cirrhosis, essentially infectious in origin and most commonly following chronic calculus obstruction of the common duct. A localized form of biliary cirrhosis is seen in the right lobe of the liver in cases of chronic cholecystitis. The early stage of this condition is really a lymphangitis which is propagated along the numerous lymphatics which connect the gallbladder and the liver. In this manner hepatitis may be an antecedent of biliary cirrhosis. Similarly chronic pancreatitis characterized by an excessive deposit of fibrous tissue becomes pancreatic cirrhosis which is inflammatory in origin and is preceded by the stage of pancreatic lymphangitis. It is our belief, based on this conception, that there is a similarity in the modes of development of chronic pancreatitis and biliary cirrhosis. The two conditions are frequently associated. The head of the pancreas is the usual area affected, for the same reason that hepatitis is most conspicuous in the region of the gallbladder, because these sites have direct lymphatic connections with the infectious cholecystitis.

In pancreatic lymphangitis the head of the gland is enlarged, swollen and soft to the touch. In the later stage of chronic pancreatitis or pancreatic cirrhosis the gland is also enlarged but firm and resistant to the touch and its nodular character may easily be misinterpreted as malignant. Chronic inflammation of the head of the pancreas is seen either as a circumscribed or a diffused inflammation. I see more cases of the former. This depends entirely upon the number of lymphatic vessels carrying the infection, and their distribution. The lantern slides will illustrate this.

It has always been my practice in teaching to emphasize the point that gallbladder disease, disease of the liver and disease of the duodenum have other possibilities than simply the damage to these particular organs, i.e., widespread injury to the peripancreatic lymph glands and lymph vessels and in turn the pancreas itself. The presence of gallstones of themselves is of little moment; it is the infective agent causing the formation of the stones that counts. If the gallbladder, the liver and the duodenum are not relieved of this infection before its dire effects are spent upon the pancreas, with which they are anatomically, physiologically and pathologically so closely related, what can we look forward to but incurable sequelæ? These post-operative symptoms give the medical man his fling against the benefit of operation, while in truth it proves the danger of prolonged medical treatment of a condition that is truly surgical from the onset of the first symptoms.

Infection of the pancreas with its occasional tendency after cholecystectomy to remain chronic and produce fibrotic changes in the gland is often a cause of postoperative symptoms which may be attributed directly to the gland or to its influence

on the mechanism of discharge of bile from the lower end of the common duct.

The diagnosis of chronic pancreatitis is usually not made before operation. There are no factors in the clinical history upon which reliance can be placed. Physical examination, laboratory tests, examination of the feces and of specimens obtained by the duodenal tube, have little significance when compared with the findings at the operating table. The frequency of chronic pancreatitis as a sequel of cholecystitis and the inability to make the diagnosis except by operative findings make us extremely doubtful of the efficiency of medical measures in the treatment of this disease of the upper right quadrant of the abdomen. Diagnosis at the operating table is based on measurable facts—the only safe foundation for therapeutic procedure. The head of the pancreas can be readily palpated by inserting a finger in the foramen of Winslow. Before doing this we always palpate the periductal lymph glands and proceed downward toward the pancreas along the gastro-hepatic omentum. But a better way of palpating the pancreas is by carrying the index and middle fingers around and under the descending duodenum and the head of the pancreas, when with the thumb in contact anteriorly the head of the organ can be definitely palpated.

There are several routes for exposing the pancreas to inspection. It may be approached above the stomach through the gastro-hepatic omentum and below the stomach by separating the two anterior layers of the gastro-colic omentum from the transverse colon, the inter-colo-epiploic route. The choice of approach will depend upon the condition at the time of operation. In cases of acute and sub-acute pancreatitis follow what seems at the time the most direct route of approach. At operation my assistant is often asked to palpate the pancreas and he has no difficulty in verifying my findings. Indeed, the operating room nurse is sometimes asked to feel for the pancreas and to state her findings.

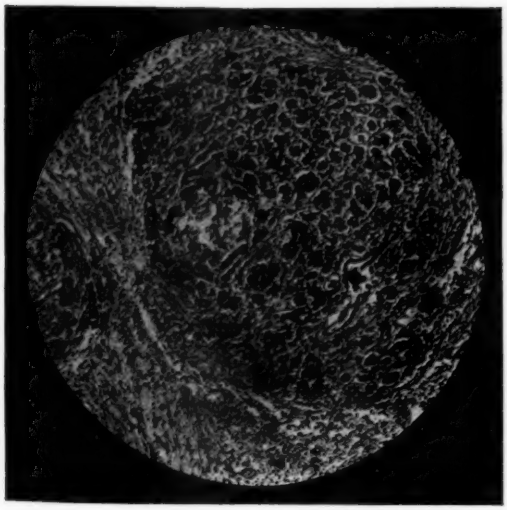


Fig. 5. Peri-lobular chronic interstitial pancreatitis.

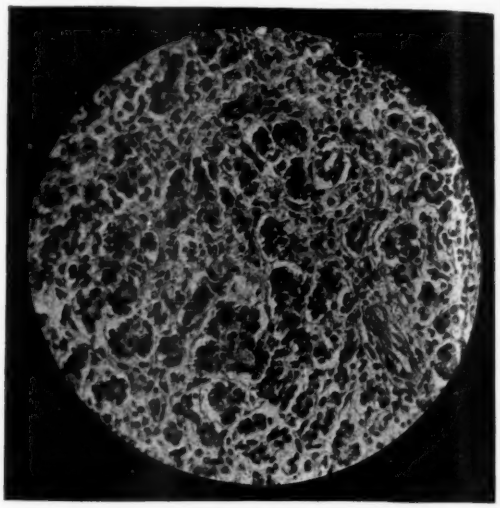


Fig. 6. Intra-lobular chronic interstitial pancreatitis.

As my experience from intimate contact with disease of the upper right quadrant of the abdomen grows and ripens, I am becoming more and more convinced that the serious lesions of this region of the body, which are the most frequent in surgery, may be prevented or at least controlled by proper surgical attention to their early manifestations.

The treatment of chronic pancreatitis is a matter of prevention which is secured by the early recognition and removal of a diseased gall-bladder. Recently there have been earnest and worthwhile attempts to detect early and atypical cases of cholecystitis by roentgenologic technic. In practised hands this procedure has been highly successful, and we hope it will influence our medical colleagues to recommend surgical

treatment early in the course of the disease. We believe that its present state of development entitles it to the position of a confirmatory diagnostic aid. Machine diagnosis, however, can never supplant clinical wisdom. The experienced surgeon has so often seen the actual relationship between symptomatology and pathology that he has learned the significance of signs and symptoms. In the case of cholecystitis a faithful history and careful examination of the upper abdomen for deep tenderness and slight rigidity reveal simple facts that transcend in value the most elaborate laboratory tests. All laboratory tests fail to a greater or less degree. The surgeon must have the courage of his convictions. While it is true that pancreatic lymphangitis and chronic pancreatitis cannot be recognized before operation, such diagnosis is only of academic interest because from the practical and therapeutic aspects we must attack the disease in its early stages when it is confined to the biliary tract and when its presence is unmistakably manifested. The early symptoms of cholecystitis are not colic and jaundice but so-called dyspepsia. Likewise the early lesions are not gallstones and gross changes, but thickening and induration of the walls of the gallbladder, lack of muscular tone, enlargement of the regional lymph glands and often visible changes in adjacent areas of the liver. A keen knowledge of surgical pathology gained at the operating table and verified in the laboratory is highly essential in the treatment of disease of the biliary tract. Too often the surgeon does not remove a diseased gallbladder because he fails to recognize the early lesions of cholecystitis. It is almost unnecessary to remark that the ideal procedure is cholecystectomy.

In the pre-pancreatic stage when only the upper group of glands are enlarged, removal of the infected gallbladder is curative. The relief of symptoms and permanency of results which characterize the postoperative history of these patients add justification to our belief that cholecystitis is the antecedent of pancreatitis. In cases where the infection has extended further along the lymph tract to the glands about the pancreas and with enlargement of the head of the gland, we have secured good results by supplementing cholecystectomy with protracted drainage of the common duct by a T-tube which is kept in place for several months. Even in many of these late cases the results are satisfactory. This is evidenced in patients who, having been drained for only a short time, return with recurrence of symptoms. These cases clear up after drainage is re-established and kept up for a prolonged period of time.

In the advanced stage of pancreatic cirrhosis, when the gland is firm and sometimes nodular, there is no means by which the condition of the pancreas can be improved. Sometimes as the result of fibrosis of the head of the pancreas the common duct has become obstructed and there is deep and constant jaundice. In these conditions the best procedure is to make a cholecystoduodenostomy, provided the condition of the gallbladder is suitable for anastomosis. When this is not possible and we feel reasonably sure that the condition is not malignant we drain the bile externally by a T-tube in the common duct and remove or drain the gallbladder as conditions warrant. This is not always satisfactory because the pancreatic obstruction may persist and external biliary drainage must then be permanent unless another and more formidable operation is done to unite the common duct to the duodenum at another site. It has been our experience that usually when common duct obstruction and jaundice are caused by chronic pancreatitis the appearance of the biliary tract resembles the condition found in carcinoma of the head of the pancreas, that is, there is no gross evidence of infection and the gallbladder is distended. This fact increases the difficulty of diagnosis but the obvious therapeutic procedure is to anastomose the gallbladder and the duodenum.

The mortality and morbidity of disease of the biliary tract and of the pancreas are intimately associated because of the causal relationship. The inference from this remark and the dictum of our dissertation, with which it is hoped you will agree, is that chronic pancreatitis is a sequel and complication of cholecystitis; that it develops through successive lymphatic changes which are often favored by the delay of protracted medical measures; and that may be readily prevented by timely removal of the diseased gallbladder.

DISCUSSION

DR. W. J. MAYO: Mr. President, Ladies, and Gentlemen: I think I shall do better to discuss Dr. Deaver than to discuss pancreatitis. For thirty years my brother and I have been going at least once a year to attend Dr. Deaver's clinic in Philadelphia. At various times I have been asked, "Who best represents American surgery?" and I have always answered, "John

Deaver." Of American surgeons Dr. Deaver has been the least influenced by continental thought in surgery. He came to surgery through anatomy, a route that was followed regularly many years ago, and over which traveled the most eminent surgeons of the past.

From the Sixteenth to the Nineteenth Century, England was the center of the medical sciences. William Harvey in the Sixteenth Century not only discovered the circulation of the blood, but also put physiology on a sound basis. John Hunter in the Eighteenth Century correlated pathologic knowledge. His brother, William Hunter, greatly extended the science of physiology. We should not forget that it was the Hunters who made the great contributions toward the elucidation of the lymphatic circulation. In the middle of the Nineteenth Century preëminence in medicine passed to the French, largely because of Pasteur's work. Concurrently with great improvements in the microscope, the French gave sound teaching in surgical anatomy. In teaching surgery through anatomy the Scotch eventually played a great part, and today the fine Scottish school of surgeons at Edinburgh is called the anatomical school. There the most beautiful surgical dissections are carried out with a perfection of technic that always reminds me of the work of Deaver.

Preëminence in medicine later passed from France to Germany, owing to the work of Virchow and others in pathology, especially as related to diseases caused by microörganisms. Much of these studies dealt with pathology of the dead house which, while of educational value, did not directly help the patient. The English and, I think I may say, the American surgeons have developed clinical surgery based on the pathology in the living, which knowledge benefits the patient studied. In this great work no one has played a greater part than John B. Deaver. He has been outstanding in his insistence on sound anatomy. He has contributed greatly to the literature of anatomy and, from the surgical standpoint, has published the best textbooks on antomy in the English language.

Many people make statements which they maintain at any cost, and in so doing proclaim closed minds. Dr. Deaver discusses facts as they look to him, calls a spade a spade, and supports his belief staunchly. He has an open mind, however, and when new truths are discovered and he is convinced that they are truths, he discards the old and strongly supports the new. Last, but far from least, he is a great teacher of surgery, who teaches with a saving sense of humor.

LITERATURE AND MEDICINE

Physicians need to prescribe for themselves the tonic of the muses, in the opinion of Dean Irving S. Cutter of the Northwestern school of medicine.

Extracts from the rich literary and historical background of the profession are his prescription against the mental poisoning which will make the doctor or the dentist see his work as a grind.

Robinson Crusoe, Keats, Shelley and Sherlock Holmes provide some of the reading, all related to the medical profession in some degree, which Dean Cutter recommends to the fraternity.

SOME SHORTCOMINGS IN THE SURGERY OF CLEFT LIP AND PALATE WITH SUGGESTIONS FOR MEETING THEM*

ROBERT EMMETT FARR, M.D.
Minneapolis

General Considerations: Even in the hands of the expert in the management of cleft lip and palate cases the mortality and morbidity are discouragingly high, while in the hands of those who possess no special training or aptitude for this class of work the results are generally bad. There are at present too few surgeons who are well trained in plastic surgery to treat these unfortunates, and perhaps too many general surgeons who are only too willing to attempt it.

Broadly speaking, it is probably true that the results will not materially improve until a department has been established in every medical school for teaching the principles and practice of plastic surgery and each community is supplied with its quota of men who are properly trained for this kind of work. Johns Hopkins, at the suggestion of Staige Davis, has already established such a department.

An analysis of my work has left me with a retrospect of too many failures and too high a mortality when I compare my results in the treatment of cleft lip and palate with my other surgical achievements, unsatisfactory as the latter may have been.

It is my purpose in this message to consider some of the causes of my failures, as these causes no doubt closely correspond to those of others who have attempted this type of work. I also wish to suggest some points in technic and management which have aided me during recent years.

Mortality: The high mortality in cleft lip and palate is due to various factors. Important among these is the fact that these children are, as a rule, below par and many of them do not reach maturity even though no surgical attack is made upon them. Most of them must undergo multiple operations. The technic is more or less complicated, especially for those who treat a case only occasionally, and the operation is apt to be unnecessarily prolonged or hurriedly performed.

*Read before the Minnesota Academy of Medicine, St. Paul, Nov. 10, 1926.

Many cases are operated upon without the proper preparation under a pediatrician and are therefore unfitted to undergo the ordeal. Postoperative care is not properly supervised.

Morbidity: Too often reparation is attempted without due consideration of the principles involved. Technical pitfalls are not anticipated. Also early cosmetic rather than later functional results are the surgeon's objective. Lack of a definite plan of procedure and the necessary armamentarium prolong the operation and hurry the operator unduly, especially toward the close of the operation. Lack of experience is sure to interfere with team-work on the part of the surgeon and his assistants, especially the anesthetist, who should act as the second assistant. A vacillating technic thus results in prolonging the operation, increases the amount of anesthesia and interferes with "smoothness" and the completion of the operation with dispatch. No attempt will be made to elucidate all of the points enumerated above as a reference to most of them should be ample.

Fig. 1. Brophy wiring for reposition of the bones. Photograph shows ends of wires taped with adhesive during the interim of the "two-stage" operation.

General Technic: Children should be securely but humanely anchored to the table. This allows the assumption of the Rose position which decreases the liability of aspiration and improves the opportunity for intra-oral observation. Ether anesthesia is our choice for children and it is best induced by the ethylene-ether sequence. As soon as the child is completely "under," the sterile curved tube of the Junker apparatus should be inserted in the angle of the mouth and while a nurse operates the pump under the surgeon's direction, the anesthetician "scrubs up" and takes her place as second assistant. Not a moment should be lost and though haste is to be deprecated, speed is most essential. Complete, although light, anesthesia, is a *sine qua non.* Suction should replace sponging intra-orally and blood should not be aspirated or swallowed by the child.

As the field is already unsterile the matter of asepsis is relatively unimportant. Infection following operations is usually an indication that the individual was operated upon at an inopportune time.

Special Technic. Reposition of Bony Parts: In all cases of complete cleft palate the early reposition of the bony parts after the method introduced by Brophy has a marked influence in correcting the nasal deformity and narrowing the diastasis in both lip and palate and brings the bony parts into proper apposition. There are many objections offered to this procedure. Further experience will be required in order to prove that its disadvantages outweigh its good offices.

My first suggestion for a departure from the orthodox is that in carrying out this operation in extremely bad risks the mortality may be lowered by operating in *two stages.* The condition of the child must be one's guide. In the first stage, the wires are introduced and after the condition of the child has improved, the alveolar borders may be freshened, the lead plates applied and the bones brought into apposition. During the interim the wires may be taped with adhesive and allowed to project from the baby's mouth (Fig. 1). Additional safety may be offered some children by resorting to this plan of procedure.

The Lip: It is not the writer's intention to go into detail regarding the technic of repair of cleft lip. There are many excellent methods described for its reconstruction. A few points only will be stressed and one or two innovations suggested.

The following facts should be remembered: Transverse incisions along the base of the nose around the alæ and incisions along the "laughing wrinkle," i.e., through the inner edge of the M. *caninus* and mesial to this muscle and the M. *zygomaticus*, result in an almost imperceptible scar (Fig. 2). The separated ends of the M.

As soon as the lip has become solidly united the outer border should be stretched downward and mesially as shown in Fig. 4. Only a slight amount of traction should be made and this exercise should be carried out daily.

The Nose: An unsightly nasal depression is a frequent morbid result of cleft lip operations.

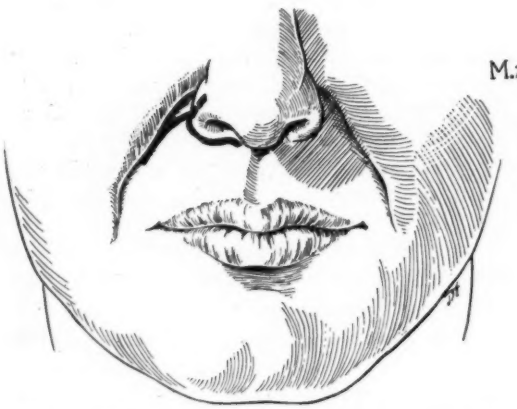


Fig. 2a. Site of incisions along base of nose, around ala and along "laughing wrinkle." Incisions along these lines result in a minimum visible scar.

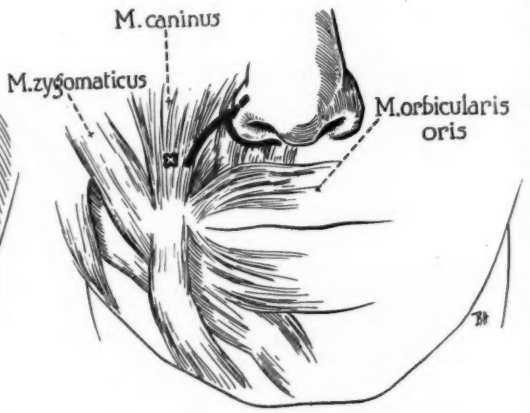


Fig. 2b. Shows that proposed incisions avoid important muscles. X represents the site of important artery which should not be severed.

Note—As the lip is drawn mesially the outer angle of the incision along the "laughing wrinkle" approaches the nasal ala and almost disappears. Lip tension is decreased by this incision.

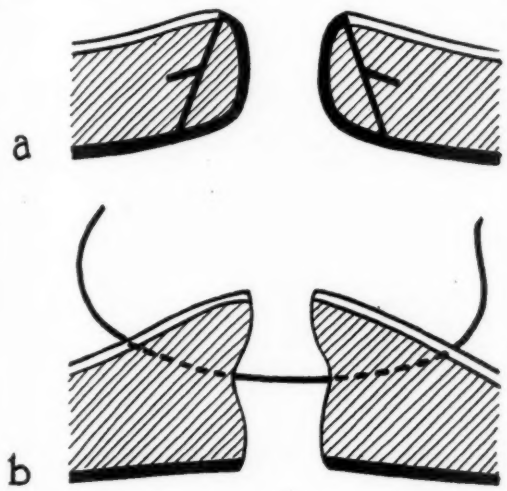
orbicularis oris should be brought into as perfect juxtaposition as possible. The line of union may be straight, as in the classical operation, or diagonal, as in the Owen operation or one of its modifications. In paring the mucous membrane the edges which are to be approximated should be cut slightly on the diagonal. This may be accomplished by slanting the scalpel so that its point is directed somewhat outward as it approaches the oral cavity (Fig. 3a). This contributes in part to the much needed thickness of the lip. If still greater thickness is demanded, each border of the lip may be split vertically as illustrated in Figure 3, a and b. After suturing the mucous membrane, wide, permanent tension sutures should always be employed (Fig. 3c).

Regardless of the technic employed for its restoration the lip is prone to appear retracted and thin when compared to its fellow. This is especially true when early lip repair is depended upon to bring the separated alveolar processes together. Here lip tension is the force demanded by this procedure.

For the purpose of overcoming the retraction, thinning and tension of the lip, the writer would suggest the following or second innovation:

Wide separation of the alæ or a deflection of one of them also frequently occurs. In order to overcome the first, the writer suggests the following procedure: Place a towel pin with its points through the septum at the tip of the nose (Fig. 5), as an elevator. With a blunt-pointed scissors mobilize the prolabia. The third innovation which the writer wishes to suggest is that, if indicated, one should not hesitate to divide the nasal septum at its base until the tip may be elevated to the desired position. Incisions about the alæ may also be indicated in order to bring about the desired effect (Figs. 2 to 5). The nostril or nostrils are now formed and if the incisions have been properly placed, a symmetrical nose accrues. In the bipartite type, a wide mobilization of the depressed ala is usually all that is required. In the tripartite type the writer would suggest a fourth innovation—the utilization of the prolabia for a continuation of the columella, which will invariably be found too short after the necessary elevation of the nasal tip is accomplished. The use of the prolabia as a portion of the lip is of questionable necessity. Even

with the utmost care, it may become a cosmetic menace as growth progresses (Fig. 6). Its muscular and therefore functional element is probably negligible and it may, we believe, be sacrificed for cosmetic purposes.



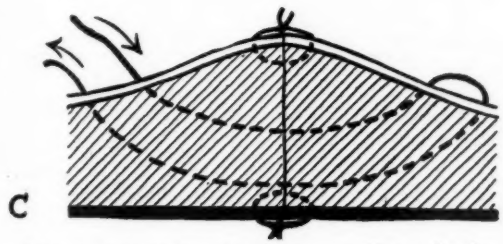


Fig. 3. Cross section of cleft lip. a. Shows direction and site of incisions. Diagonal incisions plus a vertical split adds much needed thickness to the lip. b. Shows mattress tension suture passing through the angle of the vertical split, returning through the deeper tissues. c. Shows the result of the application of the principles suggested in a and b, additional thickness.

A fifth suggestion is that lip tension be more often reduced by the use of incisions along the "laughing wrinkle" (Fig. 2).

While the repair of cleft lip presents technical difficulties which are calculated to absorb a surgeon's attention to the full, an estimation of the child's resistance must receive the most careful consideration. Every effort must be made to complete the operation as quickly as possible and with the minimum amount of anesthesia, hemorrhage and trauma. The inevitable trauma, a moderate loss of blood and prolonged anesthesia too frequently result in death from shock.

In children, especially those with the tripartite cleft, the writer would suggest a sixth innovation—the performance of the lip operation in two stages. In the first stage, complete mobilization is carried out and the nasal defect only overcome; in the second stage—after the lapse of a few days—the borders of the lip are freshend, and, if necessary, lateral incisions for the relief of tension are made and the sutures applied (Figs. 2-5).

The Palate: The failure to obtain union of the soft palate may be due to some unrecognized infection about the oral mucous membranes at the time the operation is performed, or to errors in technic during its performance. These may consist of trauma to the soft tissues, rupture of the posterior palatine artery, an incomplete mobilization of the flaps, or the application of too great tension upon the sutures.

Given a case in which the palate has not been previously operated upon, the following plan is suggested: *Equipment*—Three special elevators (Fig. 7) answer almost every purpose. In making the elevation the greatest difficulty arises

Fig. 4. Method of stretching the cheek; a postoperative exercise suggested for the purpose of decreasing tension and retraction of the lip.

mesially at the junction of the hard and soft palate. At this point a sharp-pointed scalpel is passed through the soft tissues less than one-eighth of an inch from the mesial border, where an incision one-half inch in length is made. The posterior border of the bony palate occupies the center of this incision (Fig. 8). Through this incision the point of a Crile dissector (Fig. 7a) is introduced against the bone and with it the dissection is begun. The elevator (Fig. 7b) is now

employed. By grasping its handle firmly and keeping its point forcibly in contact with the bony surface, and with a prying to and fro motion, forcing the handle of the instrument away from the midline, the mucoperiosteum of one side may be completely freed in a few moments.

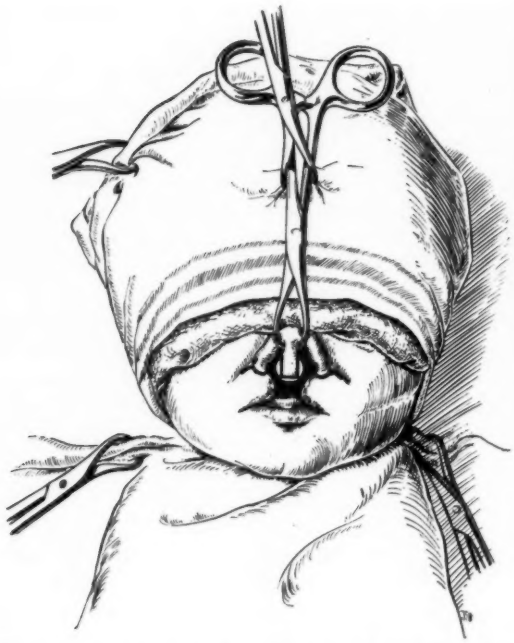


Fig. 5. Simple and efficient method of controlling and elevating the depressed nasal tip, direction of incisions about alae and the prolabia when the latter is to be used as a prolongation of the columella.

Avoidance of Injury to the Posterior Palatine Artery: As rupture of this artery on either side is inimical to success in every cleft palate operation, the technic of the mobilization of the tissues in which it lies often becomes the crux upon which success or failure depends. Its injury may be avoided in the following manner: Approaching from in front, after the anterior portion of the palate has been mobilized, the elevator (Fig. 7c) is introduced behind the border of the bony palate and its point directed upward, i.e., toward the base of the skull and deeply into the soft tissues. It is first carried upward and backward toward the velum. By this means the soft palate is put on the stretch and its mesial mucous membrane may be severed with a scissors as close as possible to its nasal attachment. The elevation is now continued outward posterior to the last tooth and toward the cheek. The curved point of the elevator should be directed toward the base of the skull and every effort exerted to prevent perforation of the soft palate just posterior to the last tooth. The

Fig. 6. Photograph of a four year old child operated upon by the writer when she was ten weeks old. Prolabia was used as a portion of the reconstructed lip with a bad cosmetic result.

mobilization should be continued until the tissues of the palate, when held in position by hooks, will overlap at least one-half inch. It may not be unwise to encompass the distal end of the elevator with a small gauze sponge when working in the region of the posterior palatine. A complete freeing of the soft tissues in the manner described will almost invariably obviate the ne-

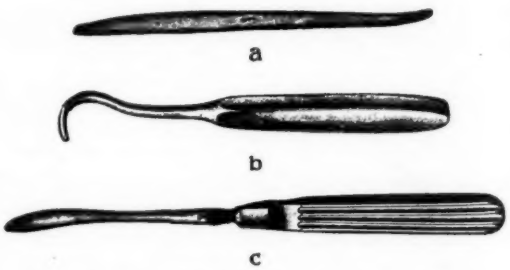


Fig. 7. Three types of elevators which greatly facilitate the mobilization of palatal flaps.

cessity for making lateral incisions in primary operations. In cases which have been previously operated upon, or in which perfect bony approximation has not been accomplished, lateral incisions are usually necessary.

The seventh innovation to be suggested is the two stage or delayed suture of the flap in closing palatal clefts. The writer believes that the mortality may be lowered in certain instances by resorting to the two stage operation. In secondary palate operations, or even in primary ones, the method may be used. Only a few days should elapse, as the secondary suture of the flaps should be accomplished before they have had sufficient time in which to contract. It is not improbable that in all secondary operations, especially when the blood supply has been restricted by a former operation, the two stage method will give a higher percentage of successes, even though it is not necessitated by the poor condition of the patient. In suturing the palate, redundancy of soft tissue will allow the inversion of the suture line toward the oral cavity with a wide approximation of the flaps. In other words, a side-to-side rather than an edge-to-edge union should be one's objective.

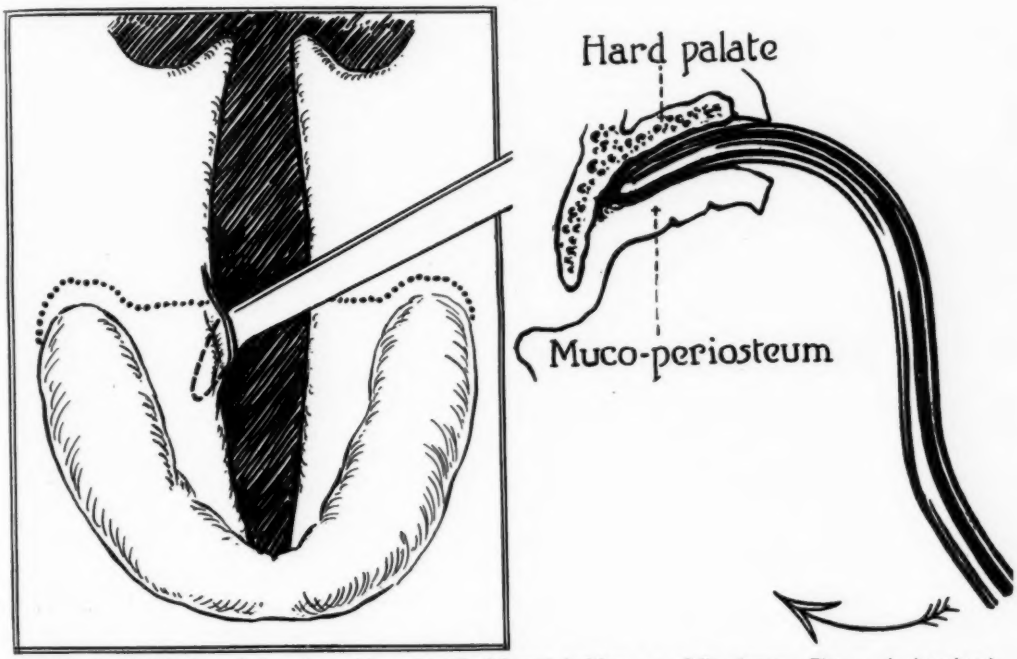


Fig 8. Mobilization of the palate without the aid of lateral incisions. a. Crile elevator, Fig. 7a, is introduced through a short incision at the junction of the hard and soft palate. By this means the posterior border of the hard palate is defined. b. Elevation is completed by means of elevator shown in Fig. 7b. The elevator shown in Fig. 7c is an excellent one for mobilizing the posterior or soft palate (see text).

SUMMARY

The management of cleft lip and palate is difficult and the results often unsatisfactory.

More highly specialized training is desirable.

Methods of procedure are not as yet standardized.

The following innovations are suggested:

1. The Brophy wiring may be done in two stages.

2. Postoperative manual stretching of the lip will relieve tension, increase redundancy and prevent its thinning out.

3. The nasal septum may be divided at its base to allow proper elevation of the nasal tip.

4. The prolabia may be used as a prolongation of the columella rather than a portion of the newly constructed lip.

5. Lip tension should be more often relieved by making incisions along the "laughing wrinkle."

6. Cleft lip may be closed in two stages.

7. The delayed-flap method of suture of the palate may be indicated in certain cases and in every case of failure to obtain union a secondary suture should be made during the second postoperative week.

DISCUSSION

DR. H. P. RITCHIE (St. Paul): Dr. Farr's paper has been most interesting to me. He has had a very wide experience which antedates mine in this field of work and his opinions must receive earnest attention. He brought up, amongst other things, two questions which are debated in the literature. One is wiring of the bone for closure of the process cleft. Quite a number support Dr. Brophy. There is an equal number who say that this should not be done because such a procedure causes a lack of development in the bone which, as the patient grows, results in the deformity of a projecting lower jaw beyond the upper, a condition of apparent prognathus. So we have a divergency of opinion as to whether we should use wires in closing the alveolar process.

With the lip also we have a number of views; I believe there are something like ten or fifteen different plans for repair of the lip. The lip problem has been approached as a plastic repair and there are so many different angulated, curved incisions that one is at a loss as to what should be done. To my own satisfaction I have worked this out as a general surgical operation, by which a functionating lip can be obtained by bringing the orbicularis oris muscle together in the line and plan of its action. What we should do then is to demonstrate this muscle by the Faradic battery and bring it together.

Dr. Farr mentions the bilateral aveolar cleft, calling this case tripartite. He suggests that the prolabium should be removed. But there is no question but what it appears in every normal lip and therefore I believe it should be preserved, as I believe the length of the lip on the skin side is determined by the length of the prolabium. In all normal individuals we have the mucous membrane everted.

I think Dr. Bropy is right on the alveolar process cleft and that in cases of wide process cleft we must hold this down with a wire so that a lip can be done without severing all the normal relations of this wonderful musculature of the face and the underlying bones. I think Dr. Brophy is absolutely wrong about the hard palate cleft. I believe that lateral pressure on that cleft will result in the high arched palate as a result of the mechanical pressure.

The mortality in these cases can readily be controlled by erasing the idea that any procedure is an emergency procedure. These babies must be distinctly on the gain before operated. They must be operated on without doing too much at one time. Pediatrics has come to such a point that I think no surgeon should undertake these operations unless he has the O. K. in writing of the pediatrist that it is safe to do the necessary work. I believe we should erase from the lip repair the plastic idea, and approach it from the standpoint of function, and replace these tissues as nearly normal as possible with the idea that the future growth of that baby will eventually classify our work.

DR. FARR: I wish to thank Dr. Ritchie for his discussion and the elucidation of many points I have not had time to cover in my paper. I feel that the crux of the problem is to treat each case in a comprehensive manner and to operate by the fractional method, also that each surgeon should use methods which in his own experience give the best results until the masters have standardized the technic. If, for instance, a certain type of lip operation is followed, one will soon familiarize himself with it and obtain satisfactory results. Future function rather than immediate cosmetic perfection should be the aim.

I visited Dr. Brophy frequently for many years and observed his work and his results. I have seen the Brophy procedure attempted by many surgeons, but have never seen Brophy's technic exactly duplicated. Brophy does not interfere with the germinal tooth roots, nor does he "crush" the superior maxillary bones; the bones are pressed together and the wires are used for the purpose of holding them in contact.

Blair is veering away from the Brophy plan and claims that the superior maxilla does not grow in proportion with its fellow after the reposition. I cannot understand why this should be. Provided the wires are introduced too high the future teeth may be interfered with, the alveolar processes may be deflected, future bony development will be faulty and the teeth will be irregular and badly directed. I believe this operation is seldom carried out in accordance with Dr. Brophy's directions; in his hands the results are the best I have ever seen.

Up to a few years ago it was Dr. Brophy's custom to show twenty-five or thirty cases during meetings of the American Medical Association and his demonstrations were most convincing. Unfortunately very few surgeons remained for these demonstrations. One could see there patients that had been operated upon ten, twenty or even thirty years before. They looked well and spoke well.

Considering the mortality of the wiring operation, we must not forget that over thirty years ago Dr. Brophy performed his first two-hundred and eleven (211) operations without a death.

To return to my paper, my intention was to stress the possibility of lowering the mortality by more often operating by the fractional method and the morbidity by aiming to get functional as well as cosmetic results. Of the innovations suggested in my paper the most important is, I believe, the closure of the palate in two stages. I have not seen this suggestion in the literature, but I believe a secondary attempt to close the palate from seven to fourteen days after failure is of sufficient merit to well repay us for the time spent in this discussion.

DR. A. T. MANN (Minneapolis): I have done this same thing, and if you can do it before the tenth day you will not have to pare the parts because your granulation tissue is there and will heal more promptly than a fresh wound.

A CLINIC ON SURGERY OF THE STOMACH*

ARNOLD SCHWYZER, M.D.
Saint Paul

It will be our aim to show or simply report a few cases of varying types of conditions without attempting in any way to cover this large field.

As demonstrating the freakishness of some injuries to the stomach let me report to you the findings of a case which came into the hospital in a condition of shock, quite inordinately pronounced considering the findings at operation. A policeman had been shot. In the greater omentum, which was very bulky, a small suggillated opening was seen. It corresponded with the wound of entrance on the skin. Underneath the omentum, quite near its insertion, a bullet hole was seen in the transverse colon. Neither on the body surface nor in the abdomen was there another wound found. The man was quite fleshy. He had surprised some robbers in a store, who crouched down behind some furniture and shot at him. A slightly upward course of the bullet was anticipated. The transverse mesocolon was incised in the search for a possible effusion in the lesser peritoneal cavity and for further exploration. Nothing was noticed except a slightly hemorrhagic area, quite small in extent, in the gastro-colic ligament. Nowhere was there an extrusion of intestinal contents, nowhere a marked hemorrhage. The condition of the patient demanded prompt finishing of the operation. He died under gradually increasing symptoms of shock. The autopsy revealed a most remarkable course of the bullet. Besides the one bullet wound in the colon there were three more holes in the hollow viscera, every one of them extraperitoneal and none of them therefore causing an escape of contents into the peritoneal cavity (Fig. 1). The bullet had entered the omentum, had run upward and backward, penetrated into the transverse colon and left it at the upper posterior side to follow an extraperitoneal course in the bulky gastro-colic ligament and to enter the greater curvature of the stomach. It left the stomach again near the pylorus extraperitoneally, entering the pancreas, and finally was stopped by the vertebral column. It had passed between aorta and vena cava, injuring neither of them apart from a tear 1 cm. long in the intima of the aorta. We found a hemorrhagic imbibition of the prevertebral tissues and a hemorrhagic cavity with necrotic looking walls, located in the head of the pancreas. The stomach was full of midnight lunch, too coarse too have been removed by the stomach tube. The death resembled much the prompt collapse one sees in acute pancreatitis, and I will follow this thread to say a few words about the differential diagnosis between acutely perforating ulcer of the stomach and other acute conditions of the abdomen.

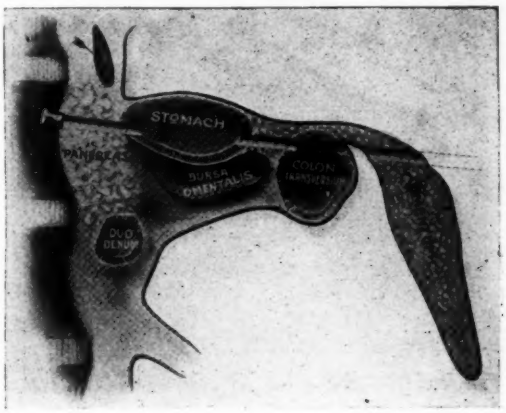


Fig. 1. Tract of bullet entering omentum, perforating transverse colon and stomach by one intra-peritoneal and three extra-peritoneal wounds.

Before all let me say that quite often the behavior of the patient as seen from a distance, and the history of the case, will give you the most valuable information. Permit me to emphasize this by a concrete example. I was called toward midnight some time ago by the house surgeon of one of our hospitals. An acute abdominal condition in a patient, just brought in, had to be taken care of. I asked for the doctor's opinion. He thought it looked like an acute gallbladder or a perforating appendicitis. I wanted some anamnestic data, probably somewhat reluctant to get up out of my first sleep. He said, the patient, a street-car motorman, had been working right along, even after supper that evening. He was a very strong appearing man and had not had previous abdominal or gastric symptoms; his pulse was good and full. He was lying motionless in

*Read before the Minnesota State Medical Association, St. Paul, May 17-19, 1926.

the bed, moaning from excruciating pains all over his abdomen. The abdominal walls were as hard as a board. These points were not as much volunteered as brought out on questioning. They are seen by everybody but may not be noticed in particular by those who are not aware that they of these overwhelming pains together with the unmistakable early symptoms of severe collapse, the consciousness of impending death, the thready pulse, the rapid fading away of all resistance. The abdomen is hard, but not as boardlike as in a perforated ulcer; the pain is rather more lo-

Fig. 2. Hour-glass spasm and notch at lesser curvature, simulating a penetrating ulcer of the lesser curvature and an hour-glass constriction.

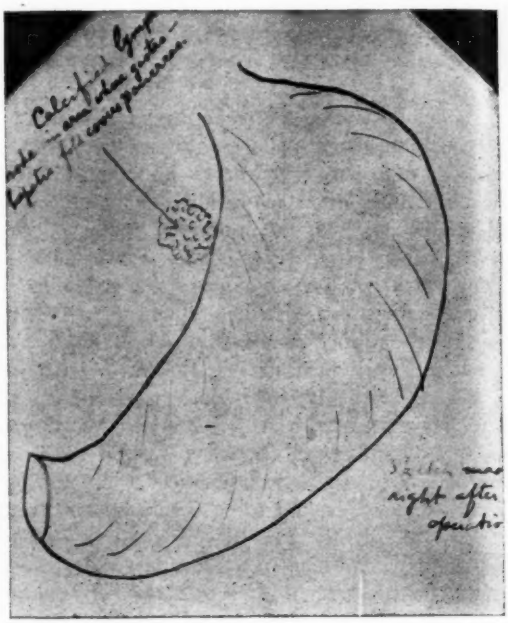


Fig. 3. Same case as Fig. 2, findings at operation; calcified lymph node in lesser omentum.

are of prime importance and are really telling what is wrong in that abdomen. "Doctor," I said in as friendly a way as one just waking up from a well earned sleep is able to, "it is neither." "Well, what do you think it is?" "I think it is a perforated ulcer; I shall be there right away. Get things ready for immediate operation." These symptoms were classical for a perforated ulcer: The patient moaning from severest pain, lying motionless on his back, the muscles of the abdomen boardlike, but the pulse full and pounding.

Why was it not an acute pancreatitis just as likely? Because the pulse was full and pounding; because there was not the predominant picture of collapse. The pain in a peracute pancreatitis is the worst there is; it is absolutely overwhelming. *In pancreatitis of the peracute type* the initial symptoms are a very rapid onset calized to the upper abdomen and the patient is not holding himself in such an absolutely immobile position.

Now take an *acute gallstone colic.* The pain is at times simply excruciating, but it usually changes somewhat in intensity, and instead of carefully remaining in the same position, the patient rolls about, doubles up and constantly changes the position. The pulse is good, there is no collapse; the region of the right border of the ribs is the most tender to pressure. The history often helps to point toward gallbladder trouble. In severest forms of acute or even gangrenous cholecystitis with a peritoneal exudate the patient, to be sure, holds himself quiet, but the pain is then worse over this area.

In renal colic the abdomen is not as extremely hard and there is usually a hint in the history. A suddenly rupturing appendicitis again will keep

the patient rather motionless. The pain is great, but not as severe as in any of the mentioned conditions of the upper abdomen; there is a history of abdominal pain or discomfort for probably several days or a week, and mostly previous minor attacks. The pain may be all over the abdomen, but the tenderness is severest over the lower parts.

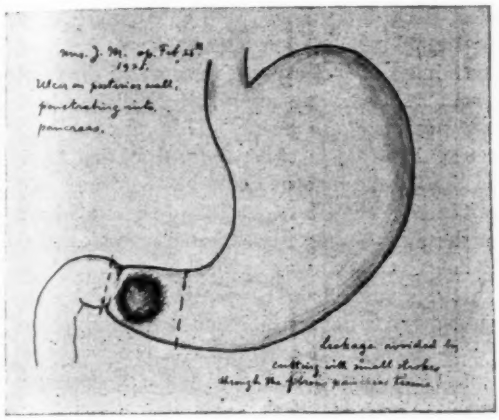


Fig. 4. Mrs. J. M. Ulcer penetrating into pancreas. Lines of resection.

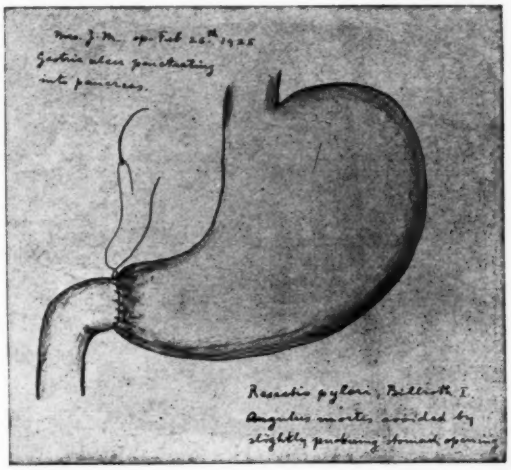

Mrs. J. M. op. Feb 25th 1925
Gastric ulcer penetrating into pancreas.
Resectio pylori, Billroth I.
Angulus mortis avoided by
slightly puckering stomach opening

Fig. 5. Same as Fig. 4. Billroth 1 without angulus mortis.

What is the best treatment for acutely perforating ulcer? Our standpoint in case of duodenal perforation, which is the most frequent, is: Practically never flushing of the peritoneal cavity, as any case which comes to the hospital in a still operable condition has a *local* soiling of the peritoneum, even if the contents appear spread far over the whole abdomen. All of the peritoneum is not involved. We mop with moist cloths and afterwards insert a large moist (not wet) gauze into the Douglas pouch, this manipulation to be done without damaging the endothelial lining. This gauze is to remain for gradual absorption of whatever fluid gathers during the further procedures of the operation, which consist, if it can be easily done, of excision of the ulcer, otherwise of closing the perforation by suture and of a gastro-enterostomy. Of late years we have added to the latter procedure the tying off of the plyorus with a double forty-day chromic catgut, a strip of fascia or the round ligament of the liver. This is not much additional work and insures rest for the ulcer area in the duodenum, at least during the most critical time. This same thing we do in non-perforating, but bleeding duodenal ulcers.*

This being a clinic and not a regular discourse on surgical diseases of the stomach, allow me to show you some sketches of cases operated upon rather recently. They will illustrate some of the varied problems, and at the same time each one has some interesting peculiarities.

Figure 2 is an *x*-ray picture of a stomach with a constant hour-glass constriction far up toward the cardia. On the lesser curvature you see a bulging like a niche. We thought we should find an ulcer at this point and a spastic contraction simulating an hour-glass stomach. We were therefore not surprised to find that this constriction had disappeared in narcosis, but there was no ulcer either. The apparent niche was the shadow of a calcified lymph node (Fig. 3) in the gastro-hepatic ligament, as the sketch shows. Firm adhesions to the abdominal walls due to a former operation for appendicitis twenty years ago were found in this case and were divided. The patient is completely relieved of the food discomfort which had existed for eighteen years. He later came to the office to thank us for the relief he has experienced.

Gastric ulcers may be excised with knife or cautery. To counteract a re-formation, a gastro-enterostomy ought to be added. The best re-

*Very recently, since reading this paper, we have excised an acutely perforated duodenal ulcer and included in the excision the anterior portion of the pyloric sphincter, as Judd advised in non-perforated cases. The result was excellent.

sults we get, however, undoubtedly by resecting the pylorus and this is the method of choice. If a Billroth 1 can be done, the anatomic result is most satisfactory. The weak spot in this procedure is the junction of the suture which reduces the size of the stomach opening with the

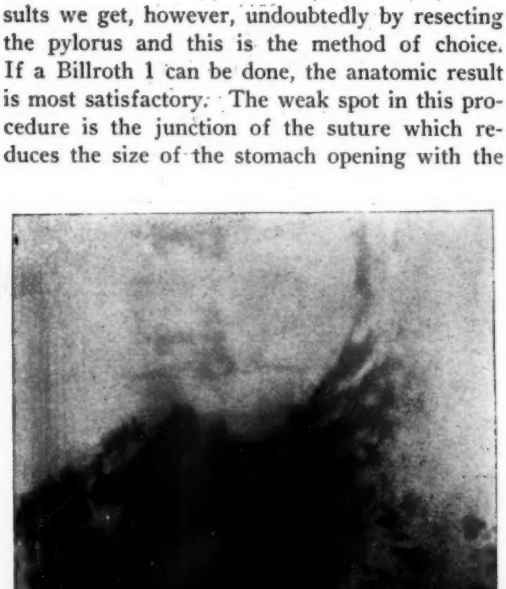


Fig. 6. Same case as Figs. 4 and 5. X-ray after resection showing normal condition.

circular suture of the new gastro-duodenal anastomosis. This point was called the *angulus mortis*, and in order to avoid it Kocher closed the stomach entirely at the line of resection and then implanted the duodenum into the posterior wall of the stomach. This seems, however, an unnecessary complication, because the tension at the line of anastomosis is of course increased as we displace the opening in the stomach to the left. And any tension in the suture must be avoided as very dangerous.

The lady, you see here, Mrs. J. M., sixty years old, was operated upon Feb. 26, 1925, for a gastric ulcer by resection of the pylorus (Fig. 4). The ulcer had penetrated toward the pancreas. With long shallow cuts the pyloric portion together with the fibrotic bottom of the ulcer was removed, making use of the fibrous thickening of the pancreas. Opening of the ulcer bottom and soiling of the field of operation was thus avoided. The resected area was 7 cm. long at the lesser curvature, but the duodenum being rather free, a direct end-to-end union between stomach and duodenum according to Billroth's method No. 1, could be made (Fig. 5). As the stomach was not very wide at the site of resection, the two openings could be circularly united by simply taking larger bites on the stomach side, and thus avoiding a partial closure of the gastric outlet by a separate suture, which always leaves the weak *angulus mortis*. This case has its interest therefore in two points: first, that the resection of the pylorus could be performed without leakage though the ulcer had penetrated rather deeply into the pancreas, and, second, that the *angulus mortis* was avoided, and an ideal anatomic configuration was thus possible. The patient can eat everything and feels entirely well. An *x*-ray of the stomach taken a few weeks ago, *i.e.*, fourteen months after the pylorectomy shows a nice duodenal cap and practically a normal picture (Fig. 6). If the Polya operation of attaching the jejunum to the line of resection of the stomach is made, this *angulus mortis* is avoided.

Fig. 7. Mr. V. A. P. Ulcer of duodenum.

The second patient who kindly consented to come here, Mr. V. A. P., 31 years old, also had a condition of special interest. He was operated upon on March 15, 1925, for a duodenal ulcer, which was far up under the ribs. The *x*-ray (Fig. 7) had shown a large sparing out at the farther end of the duodenal cap, which was present on all the films.

A gastro-jejunostomy was decided upon. The stomach was lifted out of the abdomen to reach for the emerging jejunum under the colon, but no colon was seen. No jejunum emerged. The omentum was rather moderately developed and had its attachment mainly to the left half of the stomach. We saw the peritoneum run from the under surface of the omentum toward the posterior abdominal wall, similarly as the transverse mesocolon does, but there were practically no vessels seen in this membrane. Under this peseudomesocolon you could see shining through a portion of small gut somewhat to the left of the mid-line. But it did not emerge. It was then clear that we had to deal with a non-torsion of the colon, and that we would not find the cecum and ascending colon on the right side (Fig. 8). This was readily ascertained. But where was the emerging jejunum? It was now seen that the duodenum at the lower half of its vertical portion was intimately glued to another gut. This latter could be dissected free from the descending duodenum, and proved to be the beginning of the jejunum. It was unusually muscular and large. Before using this gut for the gastro-enterostomy we had to get more information as to the remaining course of the intestine, because this very wide and muscular appearance of the jejunum might indicate some obstruction further down. Following it downward the upper jejunum appeared large and powerful, but after a stretch the gut became quite small, almost like a child's. The mesentery of this midportion of the small intestine was attached to the right of the vertebral column and this attachment reached rather far downward toward the right innominate line. Two fibrous bands ran downward from it and were fixed to the latero-posterior pelvic rim. Following the intestine further on, the mesenteric attachment was seen to run from this lowest point toward the left and upward. The intestine became again larger and finally the cecum with a long and thickened appendix was pulled into view from the area to the left of the navel. The appendix was removed

Fig. 8. Mr. V. A. P. Anatomic findings at operation; non-torsion of colon; jejunum not emerging at normal place.

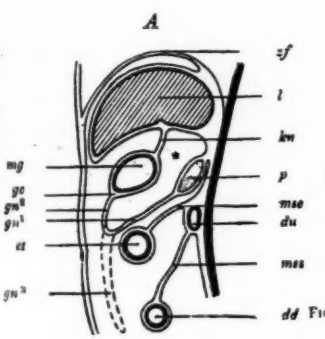


Fig. 9 (A). Development of peritoneal configuration (from Hertwig's Embryology); gn' is posterior lamella of greater omentum, before its fusion with mesocolon.

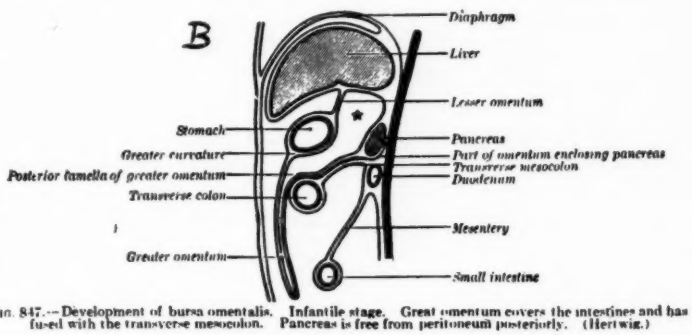


Fig. 10 (B). Same as Fig. 9, after fusion between omentum and transverse mesocolon.

Fig. 847.—Development of bursa omentalis. Infantile stage. Great omentum covers the intestines and has fused with the transverse mesocolon. Pancreas is free from peritoneum posteriorly. (Hertwig.)

and an anterior or better antero-inferior gastro-entertostomy was made. The post-operative course, though we had anticipated possible obstructive trouble from the hypoplastic midportion of the small intestine, was uneventful; the

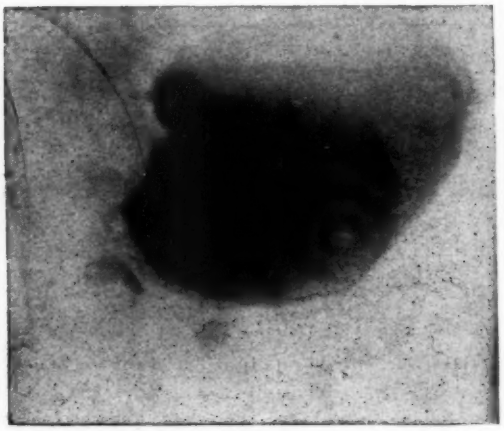


Fig. 11. Mr. W. R. Almost complete closure of pylorus and gastro-enterostomy opening.

patient being out of bed after four days. In a month he had regained his former weight.

What was the cause for the non-torsion? Was the hypoplastic mid-portion of the small intestine with its low mesenteric attachment a coördinate malformation or were the peritonitic threads at this point a part of a more generalized inflammatory condition? We had observed that from underneath the stomach near Treitz's fold, to which place we could follow the duodenum and from where it returned extraperitoneally to the right, some adhesive bands ran downward to the region of the left-sided cecum. Therefore one may venture the conception that early in embryonic life in or along the course of the vitelline vessels which in the first few weeks are most conspicuous and which later become the superior mesenteric vessels, an abnormal adhesive process or inflammatory cicatricial condition occurred. This would cause a certain degree of fixation between the end of the duodenum and the area of the cecum, and would counteract the rotary motion, back of which there cannot be much force.

I mentioned that from the under surface of the omentum the peritoneum ran back toward the posterior wall of the peritoneal cavity underneath the stomach (Fig. 9). The omentum was therefore between the two layers of peritoneum which come from the greater curvature of the stomach, from where it gets its blood supply. Its connection in the fully developed human with the transverse colon is only a secondary one

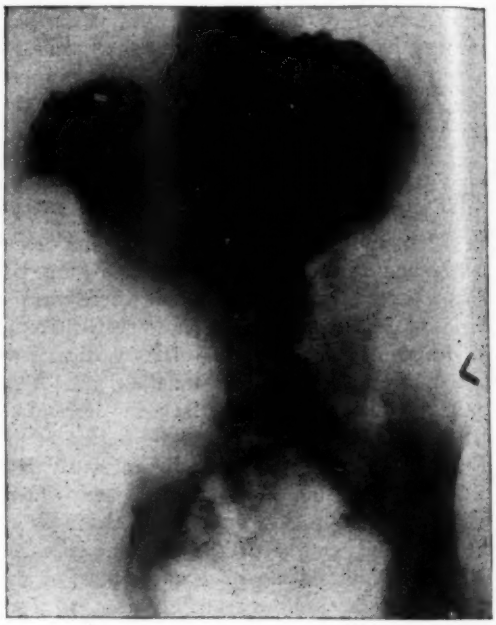


Fig. 12. Mr. W. R. Same as Fig. 11, taken a little later.

through an agglutination of its under surface with the peritoneal lining of the upper surface of the colon and its mesocolon (Fig. 10). The sketches from Hertwig's Embryology show this beautifully and explain the findings in our case, where the transverse colon was missing.

The next patient, Mr. W. R., forty-four years old, was operated upon on April 19, 1925. In 1908, which was seventeen years ago, a gastro-enterostomy had been performed. One and a half years later the same surgeon entered the abdomen again, because the patient complained bitterly of pain and vomiting. The patient was told that the former gastro-enterostomy opening was widened. A year after this on account of severe constant pain his abdomen was reopened. It appears that the patient nearly died on the operating table, and the surgeon, who is now dead, told our patient that on this account he could do nothing further. Since the first operation the patient needed morphine almost daily.

This man was brought into the hospital in a pitiable condition of pain, vomiting and emaciation. His weight was ninety-three and one-half pounds. The pain was practically constant, the vomiting daily, though he partook only of the lightest of diet and at times went hungry for a day. All these years he had frequently such bad times alternating with periods of less misery. This last spell existed for three months.

Fig. 13. Mr. W. R. Findings at operation (same case as Figs. 11 and 12).

The *x*-rays showed that, though the stomach was filled to its limits, hardly anything (Figs. 11, 12) passed through into the small gut. You could see a very faint trace after a while pass through the pylorus and at the site of the gastro-enterostomy a pocket would fill, but the contents remained there without further progress. The *x*-ray pictures had thus shown an almost complete obstruction as well of the pylorus as of the artificial stoma. The barium meal had caused great suffering and had to be removed by the stomach tube.

At the operation, the first half of which was done under local anesthesia, we had to divide numerous adhesions between omentum and abdominal walls. At the greater curvature of the stomach a mass of the size of a small hen's egg was found, and also a hard thickening at pylorus of irregular cicatricial appearance, presumably the old original ulcer. Much time had to be spent in trying to recognize the structures. The beginning of the jejunum, where it emerges from underneath the mesocolon, was identified (Fig. 13). It was followed downward and after a short course it ran into a Y-shaped portion with distinct marks of an old suture. One leg of this was clearly the efferent gut, while another, which was flatly adherent to the mesocolon, took its way upward to the greater curvature of the stomach. The thickening of the parts obliterated the anatomy to the extent that the relation with the transverse colon was only gradually and even then not entirely cleared. The condition of the patient precluded an extensive resection of the stomach and perhaps colon, as much as this seemed to be the desirable procedure, especially on account of the condition of the pylorus. However, the pyloric thickening was obviously by far the lesser trouble, at least what concerned the agonizing pain. That we had before us a gastro-jejunal ulcer seemed clear, though the small gut could not be followed as distinctly to it as my sketch makes it appear. An incision into the stomach had to help us out. With the finger in the cavity of the ulcer, which had a diameter of two cm. and a depth of 3 cm., we could dissect the walls of this cavity free from the adjoining tissues, hugging the ulcer very closely and constantly on the lookout for the colon which was part of this mass. A fine opening was then felt toward the left; this was undoubtedly the attached jejunum, greatly distorted and contracted. After this ulcerated sac had been freed on all sides and cut away from its union with the stomach, its communication with the small gut was also divided, and it was removed without injury to the colon. The whole irregular wound was then closed grasping the jejunal opening in the gastric suture. A new gastro-enterostomy away from this infected and thickened area was made farther to the left. The efferent loop, just beyond the old entero-anastomosis, was used for the new stoma. The patient made a better recovery than we had anticipated. To facilitate the emptying of the stomach we took him out of bed forty-eight hours after the operation. Though the pulse ranged between 128 and 156 during the first two days, it promptly dropped when more food was retained.

In this case, though the patient left the hospital sixteen days after the operation, in good condition, the outlook was uncertain, and indeed, last August he had a bad spell of vomiting, but after a short time he again "felt fine" according to the

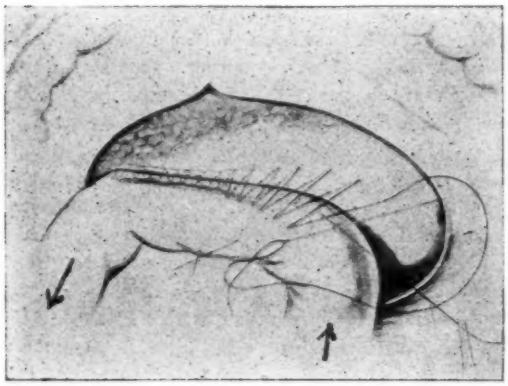


Fig. 14. Suturing in gastro-enterostomy. Isoperistaltic position of jejunum. Toward the inlet loop the sutures are put in an oblique direction and grasping broader surfaces, thus pulling outlet loop toward middle of gastro-enterostomy opening and partially obstructing the afferent loop.

report. He now tells us that his weight is 118 pounds and that he has had no pain at all since the operation. His only complaint is that he is weak. He eats everything and does not have to be particular about his food.

In this as well as in the foregoing case you noticed that an anterior gastro-enterostomy had to be performed and that in neither case an entero-anastomosis was added. I consider this entirely unnecessary if certain precautions are taken when making the gastro-enterostomy (Fig. 14). If the afferent loop is approaching the stoma from above, which means from the lesser curvature side, if furthermore this afferent gut is somewhat constricted by the suture and if it is fastened to the stomach for some distance beyond the stoma, then the gastric content has no tendency to flow into the upper loop, and in case there should be a distention of the upper loop by a filling of it from the direction of the duodenum, the bulging of this afferent loop, which in cases of vicious circle was often found to compress the efferent opening, is far enough distant not to interfere with the patency of the lower opening. Even in a very recent work on surgery of the stomach I read that in anterior gastro-enterostomy and entero-anastomosis must always be added. I am sure that this is completely avoided by our mentioned procedure, which is more easily demonstrated than described. The inlet loop comes from the lesser curvature side whether the opening be made vertical or oblique; it is fastened to the stomach for about 2 cm. beyond

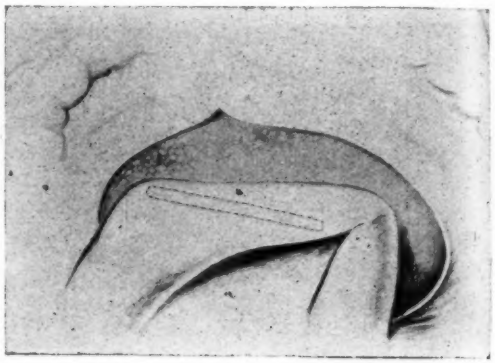


Fig. 15. Gastro-enterostomy suture finished; outlet runs freely away from the stomach.

the opening by the serosa suture of the gastro-enterostomy; and by grasping broader surfaces the inlet gut is somewhat compressed and twisted on its axis (Fig. 15). In the meantime this serosa suture is placed in a manner to make the lower loop run, not like a tangent, but more directly away from the stomach. This is accomplished by putting the stitches in the upper half of the stoma in an oblique way, pulling the gut upward on the gastric wall. The procedure was published in the April 1919 number of Surgery, Gynecology and Obstetrics.

We have not seen a vicious circle occur, since this procedure has been carefully adhered to. When vicious circle develops, lavage of the stomach must first be tried, but one should not wait long before a high jejunostomy is added in order to administer food. In 1908 I devised a gastrostomy with insertion of a catheter from the gastrostomy wound through the gastro-enterostomy opening down into the jejunum for a good distance (Fig. 16). This allows of immediate feeding, and the catheter tends to keep the gastro-enterostomy outlet into the afferent loop patent. In the meantime the afferent gut may be narrowed by a suture. In this respect the procedure is superior to the jejunostomy and, after an anterior gastro-enterostomy, almost as simple. It is better to insert the catheter even farther than shown in the sketch, which is taken from

an article of mine on "Transgastric Jejunal Feeding" (Annals of Surgery 1910).

Carcinoma of the stomach. Are there results worthwhile in surgery for gastric carcinoma? Are they of long enough duration to be called

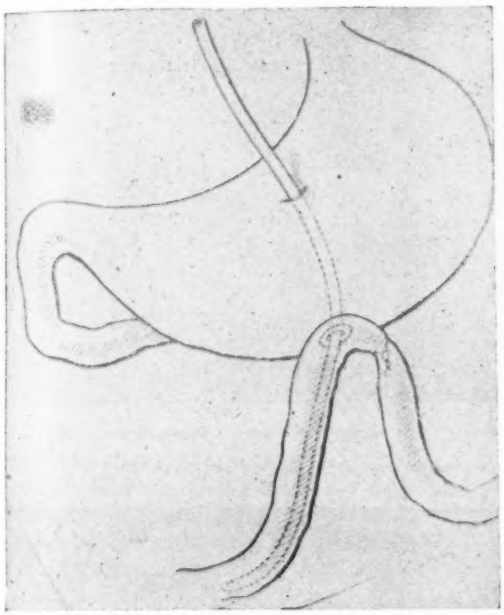


Fig. 16. Transgastric jejunal feeding in case of vicious circle.

real cures? At first one spoke of three-year cures, then the space of time proved to be too short and five years of freedom from recurrence was demanded. Still, some carcinomata have a very slow course and a case might thus be considered a surgical result without really being cured. I have personally had a patient live three years and nine months after a simple gastroenterostomy in an inoperable carcinoma of the stomach. But in this case, as in practically all long lasting cures reported after simple gastroenterostomy, the proof through a microscopic study of a removed gland or by autopsy later on was lacking, and the objection, that it may have been a hypertrophic ulcer, is justified. Thus the eight-year limit is now considered as decisive.

We all agree that early recognition of the disease is of the greatest importance, and therefore the results of operations of to-day ought to be considerably better than ten and twenty years ago, because the medical profession has learned to recognize the cases much quicker and understands the enormous importance of this promptness.

In my experience I have had six instances of cures lasting more than eight years. However,

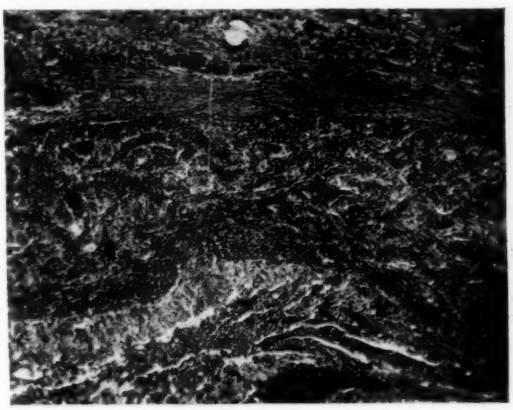


Fig. 17. Mr. F. L. V. Carcinoma of stomach, partly adeno type, partly carcinoma solidum.

three of these are unfortunately not to be proven by the removed specimens or microscopic sections, as they seem lost, and they will not be further considered.

The three patients you see sitting here have had their operations for carcinoma of the stomach more than ten years ago. Dr. Bell, professor of Pathology at the University of Minnesota and head of the pathological department, had the kindness to examine the microscopic slides and to verify the diagnosis in all three cases.

Case 1.—Mr. F. L. V. of St. Peter, Minn., was operated upon Sept. 27, 1915. The carcinoma involved half of the posterior wall of the pyloric area and two-thirds of the lesser curvature. The mass at first could not be lifted out on account of adhesions to the under surface of the liver. A small piece of liver tissue and also of the pancreas had to be taken away together with the pyloric half of the stomach. There was one large lymph gland in the pyloro-duodeno-pancreatic angle, but otherwise the glands were not affected. The microscopic picture is partly of the adeno type, partly a carcinoma solidum (Fig. 17). This patient wrote me last November: "I have been feeling fine. Appetite is good and I sleep well. I eat three meals a day and never lunch. I use tobacco, chew and smoke. I have never taken any medicine since the operation. I take plenty of exercise; have a garden in the summer and make my own wood in the winter, and do quite a bit of walking. My weight at present is 145 pounds and I was seventy years old the eleventh of Sept., 1925." He

was so busy just now with his garden work that at first he did not want to come here. As you see, the patient looks all he claims for himself. He has now been well for ten years and eight months since his operation.

is now well for eleven years and one month. The microscopic picture is that of the solid type (Figs. 18, 19).

Case 3.—Mr. H. S. was sixty years old at the time of his operation, which was on Feb. 24, 1905. The

Fig. 18. Mr. J. B. Carcinoma solidum; low power.

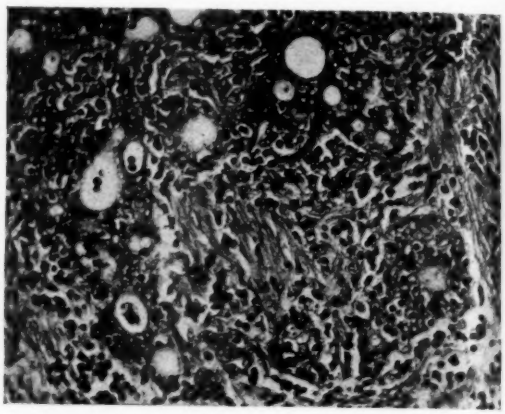


Fig. 19. Carcinoma solidum, high power (same as Fig. 18).

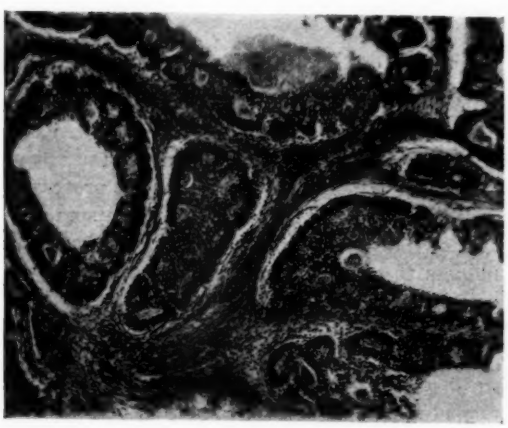


Fig. 20. Mr. H. S. Carcinoma of glandular type.

Fig. 21. Mr. H. S. Same case as Fig. 20; another section.

Case 2.—Mr. J. B. of St. Paul was sixty-six years old at the time of his operation. He had an ulcerated carcinoma of the posterior wall near the pylorus. The operation was in April, 1915. The symptoms had dated back for three years. For one year he had suffered from severe pain and vomiting. The line of resection did not leave as large a margin of healthy looking mucosa as we like to see. Nevertheless, this man, now seventy-seven years old, looks remarkably well for his years, as you can see for yourselves. He is in a good state of nutrition, and he tells me he has no complaint, no pain. He eats meat, sausage, bread and vegetables, but avoids fats and pastry. He walks a great deal. He

specimen, a carcinoma of the glandular type (Figs. 20, 21), partly ulcerated, was the size of a fist, and was on the posterior wall near the pylorus. It was given to the pathological collection of the University of Minnesota, and Dr. Bell kindly let me have it for today's demonstration. As you can see from the specimen, the resection was quite far from the edge of the tumor (Figs. 22, 23). Microscopic examination showed that for quite a distance (about 2 cm.) beyond the macroscopic edge of the tumor there was a marked change in the glands of the mucosa, which had become of much larger size and had densely invaded the submucosa. From the study of this margin we had

the impression that the lucky outcome in this case was at least partly due to the wide clearance.

The patient, as you see him here, is eighty-one years old. Though he weighs only 110 pounds, always having been rather thin, he says he is well. He worked

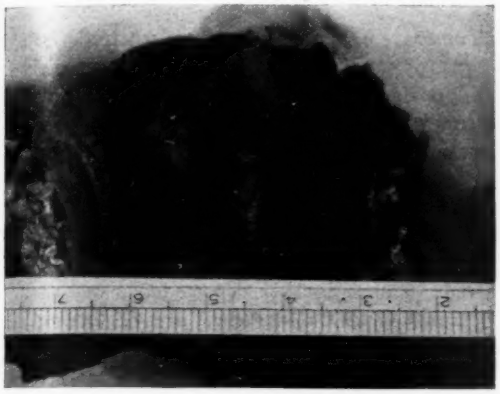


Fig. 22. Mr. H. S. Removed portion of stomach.

until a few years ago. He eats anything that comes on the family table, and has no pain though the remainder of his stomach, as the *x*-ray picture shows, is quite small (Fig. 24). His cure now has lasted twenty-one years and three months.

I was anxious to show these three patients to you, because one has to contend right along with the most outspoken pessimism as soon as the diagnosis of carcinoma of the stomach is made. With the cancer campaign for education of the public the resistance to operation has greatly diminished and thus the number of operable cases ought to increase in a great measure. The public is not far from recognizing pretty generally that treatment of any protracted gastric disturbance without competent roentgenologic examination is nothing less than malpractice. The *x*-ray examination is of enormous value for the early recognition of carcinoma of the stomach and represents the deciding argument. Like everywhere in the body the greatest improvement in our results in carcinoma is to be expected from early recognition. This applies to each individual case.

But are there features besides the early recognition which tell the surgeon that a case has particularly good chances from resection of the stomach? Microscopic examination of the growth might give us a clue; but our cases speak against this. In one of these three cases the solid type of carcinoma was found, in another the glandular type and in the third one a mixture of areas of glandular and of solid carcinoma.

However, macroscopic features which at once encouraged a far-going attempt at removal of

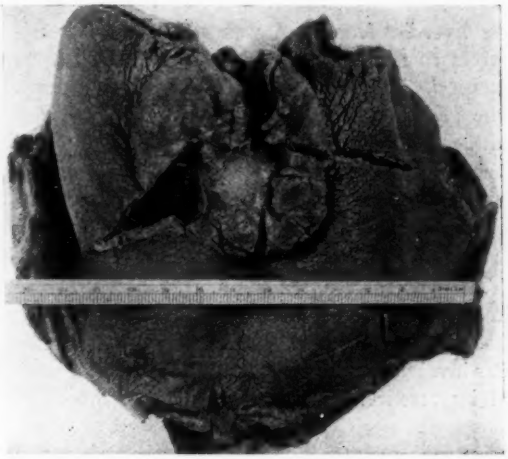


Fig. 23. Mr. H. S. Same case as Fig. 22; another view.

Fig. 24. Mr. H. S. X-ray picture of stomach, taken twenty-one years and three months after resection for carcinoma.

the affected area, were present in each case. And this feature was the complete or almost complete absence of glandular involvement. This

feature is of utmost importance, and its value is enhanced by the ease of establishing its presence or absence. In our three cases there was only in one a glandular involvement found and this was only one gland, a large one, in the pyloro-duodenal angle. Though the tumor had grown to the liver in front and was rather broadly adherent to the pancreas behind, we decided upon excision. This case was surely not an early one. The gland, which was practically in continuity with the tumor, had become quite large and still there was no further glandular involvement. The tumor therefore grew by continuity and contiguity but had very little tendency to spread through the lymph channels.

The observation made by a pathologist that from 20 to 25 per cent of all cases of gastric carcinomata, that died unoperated, had no glandular involvement and metastases, is of fundamental importance. These cases died therefore in consequence of a purely local growth. Much more than microscopic study it is therefore the simple macroscopic inspection which gives us the information needed. This information will not keep us from resecting the cases with glandular involvement, if the case is reasonably operable, but it will be of greatest importance in formulating the prognosis.

These cases of cures lasting respectively ten years and eight months, eleven years and one month, and finally twenty-one years and three months, were observed in the material of a quite moderate private practice. The well looking patients as you see them before you, with their respective ages of seventy, seventy-seven and eighty-one years, demonstrate that an extensive resection of the stomach does not mean the life of an invalid afterward, and they further emphasize the important fact that the diagnosis of carcinoma of the stomach does not at all signify an *eo ipso* hopeless condition.

Addendum. On the day of reading this paper the three men were taken to St. Joseph's hospital to be photographed. They made the occasion one for a celebration and tried to beat each other in jokes and caprioles. Two of them staged a little wrestling match for the benefit of the sisters and nurses present.

At the time of publication of this paper all three men are still in excellent condition, which adds seven months to the above stated length of time of freedom from signs of recurrence.

ENDOMETRIOMA INVOLVING THE RECTUM*

LEE MONROE MILES, B.S., M.D., F.A.C.S.
Saint Paul

Tumors containing typical endometrial tissue frequently invade the wall of the rectum or sigmoid colon. It would be expected that, with extensive involvement of the lower bowel, menstruation or bleeding per rectum would be a fairly common symptom of this condition. Reviewing the literature with this complication in mind it was found that only three cases have been reported in which rectal bleeding had occurred. Cullen[1] in 1917 reported two cases and Lochrane[2] in 1922 added the third. A brief abstract of these cases follows.

Cullen: Case 6. C. H. I. 15496. Mrs. J. S., aged 43, first seen on Sept. 19, 1916. Complaint: For the last eighteen years, since the birth of a child, the periods have been irregular and painful, the pain becoming progressively worse. The periods were also prolonged, lasting from five to fifteen days. On examination the uterus was found to be enlarged about one and one-half times normal size and posterior to the cervix was found a "puckered and thickened area apparently not over 1 cm. in diameter." Diagnosis of adenomyoma of the rectovaginal septum was made and operation was performed on the following day. Curettage and frozen sections revealed hyperplasia of the endometrium. Complete hysterectomy with removal of the suspected area of thickened rectovaginal septum was done, leaving the appendages in place.

Pathological report was typical adenomyoma of the rectovaginal septum. Convalescence was uneventful. Subsequent to discharge the patient had periodic hemorrhages from the rectum, the first being about a month after discharge; then again about Christmas 1916 lasting several days; March 1917 bleeding for four days; April 1917 and July 1917 bleeding had occurred for four days. Proctoscopic examination revealed no cause for hemorrhage and the conclusion was that the bleeding came from higher up in the bowel.

Although it is not clear in this case that the bleeding was due to adenomyoma, the periodicity of the bleeding is suggestive that the hemorrhage was likely due to ovarian stimulation of misplaced endometrium.

Cullen: Case 8. Mrs. L. D. K., aged 37. In August, 1907, ten years prior to the present admission, Dr. Cullen had removed a myoma from her uterus during pregnancy. Pregnancy was not interrupted. In 1915 a supravaginal hysterectomy had been done by another surgeon and both tubes and the left ovary were removed with a myomatous uterus. Following this operation menstruation continued, dysmenorrhea became progressively worse and intermenstrual bleeding ap-

*From the Department of Obstetrics and Gynecology of the Peking Union Medical College.

peared. Sometimes the beeding came from the vagina and sometimes from the rectum. For the last year before the present admission she had menstruated more frequently by rectum than by vagina. Dr. Cullen operated again on May 26, 1917, removing the cervical stump and a large adenomyomatous mass of tissue which had invaded the rectal wall, including in the tissue removed the anterior wall of the rectum. Microscopic study of the tissue showed it to be an adenomyoma, the endometrial glands of which had invaded the rectal wall nearly to the mucosa; the latter seemed to be intact.

Lochrane's case: Nullipara, aged 33, pregnant at the time about eighteen to twenty weeks. About one year prior to pregnancy had been told that she had a tumor in the rectum about the size of a bean. It had been called a polypus. Menstruation had always been normal and painless. At the time of examination a multilobulated non-tender mass was found in the posterior vaginal wall in the posterior fornix near the midline. It appeared to be about three quarters of an inch vertically by one inch antero-posteriorly in diameter and could be felt as a somewhat cystic mass bulging into the rectum. On one occasion about a year previously the bowels had felt obstructed and she had had bleeding from the bowel twice. The relation of this bleeding to menstrual period is not stated. A portion of the growth was removed and proved to be an adenomyoma in which the endometrium had a decidual reaction.

The following case is reported because of the rarity of rectal hemorrhage definitely associated with menstruation and also because of the method of treatment and the definite proof thereby obtained of the need for removal of the ovaries in this class of case.

Li Yen Shi, P. U. M. C. 9866, was admitted to the hospital on Jan. 13, 1925, with the following history: Aged 42, married for fifteen years, never pregnant, her menses began at sixteen years, were of a regular twenty-eight day type of three or four days duration, flow quite profuse, and only moderate pain. Ten years ago she began to have more severe pain in the lower abdomen and back and as the pain increased in severity she has had to go to bed and has taken up opium smoking, though she uses only a small amount. With the beginning of the severe dysmenorrhea the periods became irregular and the flow has been less than formerly.

She has noticed a mass in the lower abdomen for several years, though it evidently has not increased rapidly in size. During the last ten years she has had periods of hemorrhage from the rectum accompanying the menstrual periods; she sometimes has a menstrual period that is not accompanied by rectal hemorrhage, but the rectal bleeding, which comes every two or three months, always comes at the menstrual period and usually lasts a few days longer than the period with discharge of blood and mucus. She also has rectal tenesmus.

Physical examination: She had a small adenoma of the thyroid gland; otherwise except for the pelvic condition the findings were negative. An irregular mass was palpable in the lower abdomen. There was a hard nodule to the left and a round mass to the right much softer in consistency extending about 8 cm. above the symphysis. This mass on the right gave the impression of being filled with fluid. On bimanual examination the uterus could not be outlined definitely nor distinguished from the pelvic masses. The pelvic organs were fixed and immovable. No involvement of the rectal mucosa could be made out on digital examination and there were no hemorrhoids to account for the bleeding.

Operation was performed on Jan. 15, 1925, Dr. Marion Yang assisting me. Immediately on opening the abdomen and exposing the pelvic organs a most interesting picture presented itself. The right ovary was greatly distended and was composed of a number of cysts filled with dark brown material, the largest of the cysts being oval, thin walled and about 5 by 8 cm. in diameter. Some of the cysts had thick walls. The left ovary was smaller but was also cystic and the cysts were of the same character. Both tubes were patent and in the middle of the right tube was a spindle shaped thickening. The uterus was also enlarged and the walls were firm, the uterus being 12 by 8 cm. in diameter. The cysts were lying in the space between the uterus and the sigmoid colon and were very densely adherent to both structures. In the process of separation from the sigmoid the thin walled cysts were ruptured and viscous tarry material exuded. As we proceeded with the separation we soon realized that in order to completely remove the growth we should be forced to resect the sigmoid or leave portions of the tumor in the pelvis. We chose the latter course and separated as far as possible and then purposely cut through the cyst and left a portion of the thin posterior wall attached to the bowel and proceeded to remove both tubes, both ovaries and the uterus at the supra-vaginal junction.

Convalescence was uneventful except for a sudden and unexpected rise of temperature on the tenth day. She was discharged on the 21st day. Subsequent to discharge she returned on April 21, 1925, for post-operative examination. She reported that her condition was much improved, she had had no bleeding and had gained strength but was troubled slightly by the usual menopausal symptoms. On March 30, 1926, fourteen months after operation, she returned by request and stated that she had no complaints, was able to do her usual work, had no pain and no bleeding.

Pathological report of specimen. Surgical Path. number 6807. The specimen consists of the uterus, amputated supravaginally, and the adnexæ.

The uterus, after fixation in formalin, measures 11 by 8.5 by 6 cm., the cavity is 9.5 cm. in length. The uterine wall is thickened, on the right measuring 1.6 cm. and on the left 5 cm. The endometrium is not thickened. On cut section of the thick left wall the uterine muscle is dotted with small brownish spots which are numerous near the peritoneal surface. The tubes are patent and are adherent to the cystic masses that are attached to the posterior surface of the uterus.

These cystic masses, most of which are collapsed, apparently arose from the ovaries. The walls of these cysts vary in thickness from 1 mm. to about 1 cm. The cavities of the cysts are lined by rough tissue and fibrin and some contain tarry blood. The cyst that represents the right ovary is about 8 cm. in diameter and on the left side is a thick, fibrous walled cyst, the left ovary, 7 cm. in diameter. Both ovarian cysts are attached to the uterus by firm fibrous adhesions.

Fig. 1. Photomicrograph 2.5 x of a section through the left wall of the uterus. At "a" a few dilated endometrial glands invading the myometrium, "m" is normal myometrium, "e" is endometrioma invading the uterine wall and forming adhesions between the uterine wall and the ovary "o".

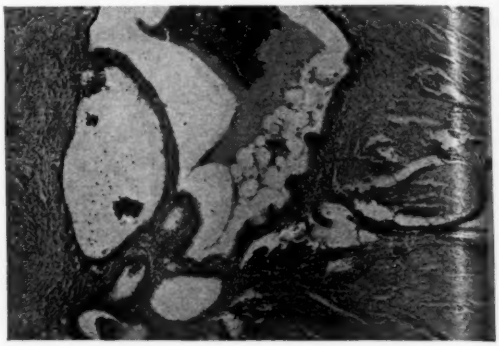


Fig. 2. Photomicrograph 50 x of the square indicated in Figure 1. Typical endometrial glands.

Microscopic examination: The endometrium is in the early stage of premenstrual hypertrophy. A few endometrial glands extend for a short distance into the myometrium. These glands are dilated and present the picture of an adenomyoma. There is then a zone of normal myometrium varying from 1 to 1.5 cm. in thickness with no evidence of invasion by endometrial glands. Byond this normal myometrium is another zone of muscle and fibrous tissue, to which the ovaries are attached, in which numerous endometrial glands are found. Serial sections of the specimen were not cut, but in all twenty-four blocks of tissue were studied of which twelve included the uterine wall. In none of these is any connection seen between the adenomyoma originating near the uterine cavity and the endometrioma originating from the peritoneal surface of the uterus (Figs. 1 and 2). The ovaries are transformed into cystic structures and are adherent to the posterior surface of the uterus by dense fibrous tissue in which endometrial glands are numerous. The ovarian cysts are partially lined by tall columnar epithelium. Desquamated islands of this epithelium are seen in crypts of the ovarian cysts and resemble curettings from the uterine cavity (Fig. 3). Figure 4 represents a section of ovary through one of the crypts in which the columnar epithelium and the endometrial stroma are intact. Figure 5 is a section showing typical endometrial glands in fibrous connective tissue from an adhesion between the posterior surface of the uterus and the sigmoid colon.

There are three important findings: (1) the early adenomyoma of the uterine wall springing from the endometrium of the uterine cavity; (2) the presence of an invading tumor composed of endometrial tissue involving the posterior surface of the uterus and the fibrous adhesions between the uterus, ovaries and sigmoid colon; and (3) the cysts in the ovaries lined by uterine epithelium and stroma. Pathological diagnosis—

Fig. 3. Photomicrograph 50 x showing one of the crypts in the ovarian cyst containing desquamated uterine epithelium.

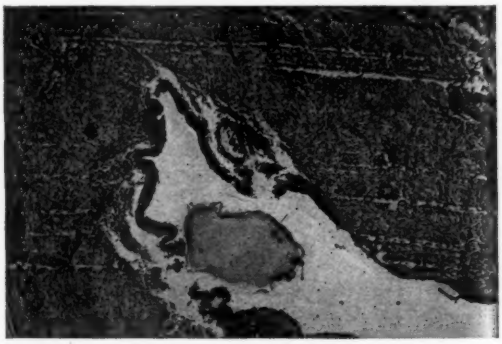


Fig. 4. Photomicrograph 50 x showing one of the crypts in the ovarian cyst in which the endometrial lining is intact.

adenomyoma of the uterus, extra-uterine endometrioma (Sampson type) involving the posterior surface of the uterus, the ovaries and the sigmoid colon.

Mention of extra-uterine endometrioma involving the uterus secondarily was made by Sampson[3] in 1925.

That these endometriomas with extensive involvement of the rectum so rarely perforate that organ with resultant bleeding per bowel is probably due to two factors. In the first place these tumors give rise to such severe subjective symptoms that the patients usually seek medical relief early in the course of the disease. In the second place it is quite evident that normal epithelium offers an effective barrier to the invading epithelium. This is illustrated in Cullen's numerous cases in which he has excised portions of the

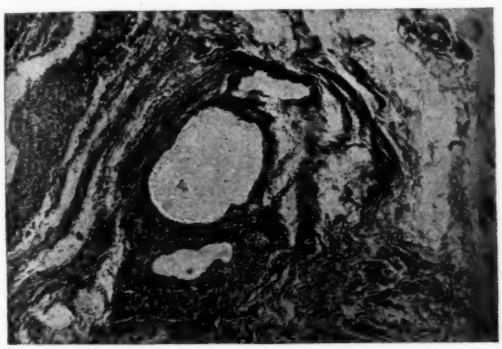


Fig. 5. Photomicrograph 50 x showing endometrial glands in fibrous adhesions between uterus and sigmoid.

anterior rectal wall with the adeno-myoma and has found, on microscopic study, that the invading endometrium stops abruptly at the basal layers of the rectal mucosa, though it has invaded the muscular wall of the intestine most extensively and may even have penetrated the submucosa. The same fact is observed in those tumors which have invaded other epithelial lined viscera. In the case of the bladder three endometriomas have been reported by Brady[4] (1925) and Keene[5] (1925) only one of which gave rise to hematuria. Penetration of the rectal or bladder epithelium apparently occurs in case the invading endometrial glands meet with sufficient resistance in the underlying tissue to form cysts which rupture into the cavity of the invaded viscus. Following the rupture of the endometrial cyst there is evidently healing of the normal epithelium and hemorrhage accompanying the menstrual period may be absent for some time until the blood has re-accumulated in the cyst. This explains the irregularity of the abnormal bleeding. Traumatic rupture with bleeding by bowel between periods may occur due to passage or accumulation of hard, dry fecal masses. These patients uniformly complain of an obstinate constipation.

The subject of treatment will be discussed in connection with the second case.

Case 2. P. U. M. C. 8418. Miss R. M., single, American, aged 34, was admitted to the hospital on July 11, 1924, with the following history:

Chief Complaint.—Dysmenorrhea which had commenced and had been increasing in severity for the last year; pain on defecation and constipation. Her past history was essentially negative. Menstruation began at the age of seventeen, has been the regular 28-30 day type, in 6-7 days duration, and prior to the onset of the present illness a year ago she had had pain only on the first day or two. Beginning about a year ago the pain has lasted throughout the duration of the flow and has been increasing in severity. She is tired, run down and has no energy for her work. Physical examination was negative except that by rectal examination the uterus was found to be moderately enlarged, retroverted and tender to palpation, the cervix being high and anterior. No tumor masses were made out. Diagnosis was made of dysmenorrhea due to retroversion of the uterus and a suspension operation was advised.

Operation.—July 12, 1924. Dr. S. T. Kwan acted as my assistant. On opening the abdomen and exposing the pelvic organs it was found that the uterus was retroverted and bound to the sigmoid by a soft hemorrhagic mass of tissue which filled the cul-de-sac. There was a small parovarian cyst in the right broad ligament. The tissue in the cul-de-sac was readily separated from the sigmoid but because of the friability of the tissue it could not be completely removed, and it was now recognized that we were dealing with an endometrioma. Supra-vaginal hysterectomy was performed and the tubes and ovaries were left in place. The parovarian cyst was removed. We debated the advisability of removing the ovaries with the uterus but as we had not mentioned the possibility of such a procedure before operation and the patient was expecting only a suspension operation we decided to leave the ovaries. At the time we mentioned that if she had further trouble we would use radium. Convalescence was uninterrupted except that she had an attack of pain in the kidney region three days before discharge. She left the hospital on Aug. 2, 1924.

Pathological Report.—The specimen consists of a small thin walled cyst measuring 2.5 cm. in diameter and the uterus removed at the supra-vaginal junction measuring 9 by 5 by 4 cms. On the posterior surface of the uterus there is a soft, red friable growth extending two-thirds of the distance to the fundus. The uterine muscle is thick but normal in appearance. On sectioning the growth on the posterior surface of the uterus, small cysts with brownish contents are seen.

Microscopic examination: The endometrium presents the picture of a moderate hyperplasia. The uterine muscle is thick but otherwise normal; there is no sign of invasion by endometrial glands. On the posterior surface of the uterus there is a mass of tissue composed of hemorrhagic areas, newly forming connective tissue and interpersed through this tissue are seen numerous glands composed of typical endometrial tissue. Some of these glands are small while others are dilated and cyst-like (Figs. 6 and 7). The sections of the cyst show it to be of parovarian origin. Diagnosis—Parovarian cyst. Endometrioma involving the posterior surface of the uterus and the sigmoid.

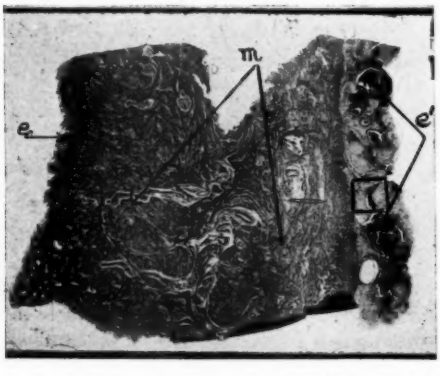


Fig. 6. Photomicrograph 2.5 x showing uterine wall with hyperplastic endometrium at "e", thick muscle wall but with no invading uterine glands at "m", and the endometrioma composed of new connective tissue, hemorrhage and endometrial glands at "e".

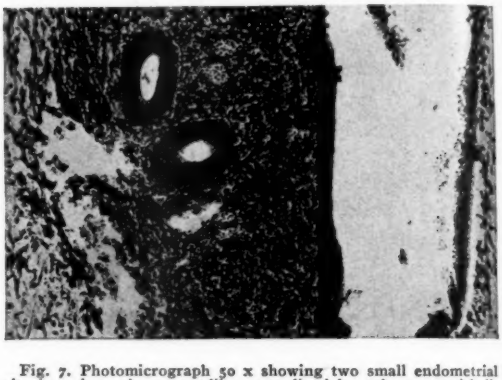


Fig. 7. Photomicrograph 50 x showing two small endometrial glands and one large cyst-like space lined by columnar epithelium, taken from the area indicated in Figure 6.

Subsequent History.—The patient went to a summer resort to recuperate with instructions to return if any untoward symptoms appeared. One week after discharge she began to have pain in the urethral and bladder region with marked frequency of urination. She returned to the hospital on August 26th. Cystoscopy was done and a normal bladder and ureteral orifices were found. On pelvic examination there was very marked tenderness in the vaginal vault and rectum and on the right side there was an indurated tender mass. It was thought that the pain and mass were due to growth of the tumor since operation, and radium was advised. On Aug. 30, 1924, 90 mg. of radium screened with 1.5 mm. of silver and 2 mm. of rubber were placed in the vagina against the cervix and the vagina was packed with gauze. A total of 2205 mg.-hours were given. Bladder symptoms disappeared rapidly with no local treatment and the abdominal pain became less. On September 12th she had an attack of pain which was only moderate and lasted a short time, and on the 17th she complained of tenderness in the rectum. From that time until discharge on September 21st she was free from pain and up and around as desired. In reply to a postoperative questionnaire sent out on April 24, 1925, seven months after treatment with radium, she stated that she was doing full work though it tired her, but she felt that she was steadily gaining in strength. She occasionally had pain in the pelvis which appeared after violent exercise, though not frequently. Menopausal symptoms had given her trouble for a few months but were rare at the time of writing. Rectal symptoms had disappeared.

Opinion as to the treatment of adeno-myomata or endometriomata extensively involving other organs has undergone a very decided change in recent years. Graves[6] (1925) states: "I may say that from what I have learned from experience and a study of cases in the literature, I cannot subscribe to the sweeping statement that ectopic endometriomata do not retrograde after removal of the ovaries; nor are we justified in making general statement to the contrary. But I am convinced that in the majority of cases the endometriomata may be counted on to atrophy in the absence of ovarian function and that this probability in their behavior is a valuable guide to treatment in cases like those of rectovaginal adenomyomata in which a radical operation would greatly mutilate the patient or seriously endanger her life." Cullen[7] agrees with this view. The two cases presented are additional evidence of the effect of oöphorectomy on endometriomatous tumors. It apparently makes little difference whether the interruption of ovarian function is secured by surgical removal or by radium inactivation.

Recurrence of symptoms has been cited in two of the cases previously quoted and this is due without doubt to the fact that one or both ovaries had been left in place after removal of the adenomyomatous uterus. Recurrence of symptoms occurred in one of the cases here presented. Unquestionably the best treatment is to remove

both ovaries at the time of the original operation if it is possible, but with the well known effectiveness of radium on the ovaries good results may be obtained in those cases in which it is impossible or unwise to remove the ovaries. Extensive resections of the bowel can be avoided in most cases if the true nature of the growth is recognized and the ovaries are removed or radiated.

From my study of the literature and from my own experience I would draw the conclusion that in dealing with adenomyomata that have penetrated beyond the uterine tissue and in ectopic endometriomata with numerous adhesions to adjacent organs in which it is impossible or inadvisable to remove the entire new growth, the removal of all ovarian tissue is the *sine qua non* of successful treatment.

215 Hamm Building.

BIBLIOGRAPHY

1. Cullen, T. S.: Adenomyoma of the rectovaginal septum. Johns Hopkins Hosp. Bull., 1917, xxviii, 343.
2. Lochrane, C. D.: Adenomyoma of the rectovaginal septum showing decidual reaction. Proc. Roy. Soc. Med., 1922, xv, Section of Obst. and Gyn. 34.
3. Sampson, J. A.: Inguinal endometriosis. Am Jour. Obst. and Gyn., 1925, x, 562.
4. Brady, Leo.: An adenomyoma of the vesicovaginal septum. Johns Hopkins Hosp. Bull., 1925, xxxvi, 266.
5. Keene, F. E.: Perforating ovarian cysts with invasion of the bladder wall. Am. Jour. Obst. and Gyn., 1925, x, 619.
6. Graves, W. P.: Relationship of ectopic adenomyomata to ovarian function. Am. Jour. Obst. and Gyn., 1925, x, 665.
7. Cullen, T. S.: Comments on preceding paper. Am. Jour. Obst. and Gyn., 1925, x, 732.

PHYSICAL THERAPY

The Council on Physical Therapy of the American Medical Association is now ready to consider devices for physical therapy. The consideration of apparatus will be governed by Official Rules, designed to protect the medical profession and the public against fraud, undesirable secrecy and objectionable advertising in connection with apparatus and methods for physical therapy. Devices and methods that have been found acceptable as conforming to the rules will be described in an Accepted List. (Jour. A. M. A., Dec. 11, 1926, p. 1999.)

ACUTE INTESTINAL OBSTRUCTION*

J. F. NORMAN, M.D.
Crookston, Minn.

The subject of intestinal obstruction has received a great amount of attention in medical literature during the past fifteen years. The morbid physiology and chemistry has been studied by many research workers, notably by Whipple and his associates and by Hartwell and Hoguet. Statistical data from groups of cases have been reported from several large clinics, by Richardson, C. H. Mayo and others.

Despite the experimental and clinical study that acute intestinal obstruction has received, the fact must be admitted that while there has been some reduction in the mortality rate due to the advancement of surgical knowledge, yet it is still far too high. The purpose of this paper is to bring up for discussion the problems of this condition as they occur in private practice and to urge early diagnosis and treatment.

This paper is primarily a short discussion of the etiology and diagnosis of acute intestinal obstruction. This will not include subacute forms or those due to malignancy.

Acute intestinal obstruction is one of the gravest conditions which the physician encounters. The responsibility for the life of the patient rests with the attendant who first sees the case. Often this attendant is in general practice, some distance from a hospital and a surgical consultant. Many lives are lost through delay in intervention, as the condition when not relieved results inevitably in death. The prognosis depends entirely on the promptness with which the patient is brought to the attention of the surgeon. Some responsibility, too, lies with the patient, who, too often, delays calling a physician.

Relief is not possible in all cases even when they are seen early, as some types carry a very high mortality, for example mesenteric thrombosis or embolism.

The mortality ranges from 30 to 60 per cent, depending on the type of case and time of operation. It appears that this mortality rate is pretty constant whether treated in the large groups in the general hospitals or by individuals in private practice. The Massachusetts General, Johns

*Read before the annual meeting of the Northern Minnesota Medical Association, Crookston, August, 1926.

Hopkins, Union Memorial and the Maryland University hospitals all report about the same high rate. George Albert Moore reports a series of cases. Those operated upon within twenty-four hours all recovered. Those operated upon during the second twenty-four hours had an operative mortality rate of 25 per cent. During the third twenty-four hour period 33 per cent, and after the third day a mortality of 65 per cent.

Obstruction may be brought about by conditions within the lumen of the bowel; polyps, impacted gallstone, fecal impaction, coprolith, masses of worms, etc. A polyp or other pedunculated growth may bring about sudden obstruction or intussusception. Fecal impaction is a very real clinical entity, especially in the old. Symptoms of impaction may at times be very fulminating in character. They occur most often at the cecum or at the sigmoid. Many of the patients are in the cancer age and the question arises whether the condition is one of sudden flare up in carcinoma of the bowel. The non-malignant cases clear up with medical care and the type of obstruction may be determined early. The patient may give a history of prolonged constipation. The general condition may or may not be good, but the cachexia of advanced cancer is not present.

An injury to the neuromuscular mechanism of the bowel, as in acute peritonitis or mesenteric thrombosis, will bring about definite signs of obstruction. Another group of cases of apparent obstruction, really intestinal stasis, will accompany acute diseases, notably renal.

Extrinsic causes of obstruction include the different types of strangulated hernias, true volvulus, bands from fetal remnants, adhesions, pressure from tumor or other mass, acute inflammatory conditions, etc. Obvious hernias are not responsible for as large proportion of acute obstructions as formerly. They are taken care of earlier, as the public is educated to the point of view that it is safer to have the ordinary hernia repaired. The condition of strangulation of hernial contents is one where even the patient is aware that a grave condition exists and a higher proportion of these cases is seen early with a low mortality. However, we still have too many strangulated hernias which have been neglected until a damaged bowel results. Ill advised and prolonged attempts at reduction may result in harm either from reduction en bloc or from trauma to the intestinal wall.

No age is exempt from acute obstruction. That occurring in the newborn is usually due to congenital malformations or failure of development of a portion of the intestinal tract. The older infants are subject to the same causes as the adult. The older adult will present a multiplicity of possible causes. My cases have ranged in age from four and one-half months to seventy-six years.

The history of the case may be of value in arriving at a diagnosis. History of previous operations, more particularly when drainage has been instituted, is important. Digestive disturbance over a period of time, colics, cachexia, constipation, previous diseases, all have a bearing on the case.

Volvulus is an example of the fulminating type of intra-abdominal obstruction which offers a very short margin of time and which produces early tissue death with early absorption of toxins from retained intestinal content. Various types of internal hernia under bands or through congenital or unnatural mesenteric openings or through a diaphragmatic hiatus, may exist and later show acute symptoms. Post-operative adhesions, intussusception, and adherent Meckel's diverticulum, also add to the number of cases.

Post-operative obstruction deserves special mention. The attending surgeon is not always at fault and cases occur after the most careful technic. The mortality here is also high. These post-operative cases may be divided into two groups: (1) those occuring a few days or weeks after laparotomy and (2) those occurring months or years later. These cases may occur under the eye of the surgeon while the patient is still in the hospital. The outcome in such cases should be favorable provided the condition is recognized early. Both types are due to the mechanical action of adhesions or occasionally in the early cases to the pressure of a pus pocket or a hematoma. Some of the very early cases may be due to local exudate, the bulk of which may obstruct one or more loops of bowel. The later cases are due to definite bands with beginning connective tissue formation in the exudate. These early bands may be separated by the slightest touch. The very late cases are the end-results of connective tissue change and can be separated only by cutting. The symptoms are those of obstruc-

tion from any cause and are not always clear cut. A differential diagnosis must be made in each case from post-operative dilatation of the stomach, ileus from infection, mesenteric thrombosis and acute pancreatitis. Acute peritonitis will resemble acute mechanical obstruction and vice versa. The symptoms may vary from hour to hour and terminal symptoms are the same for both conditions.

Intussusception as a cause of obstruction is rather in a class by itself. My personal experience with this class has been limited to five cases. All were under one year, all were breast fed, and all were healthy looking babies. Their past history was negative except in one where excessive doses of cathartics had been given over a long period of time. Three cases were from this immediate vicinity and two from out of town. Three were operated on within twelve hours, one after about thirty hours, and one after forty-eight hours. All but this last were easily reduced. In this patient resection had to be resorted to and an enterostomy tube left in situ. All recovered except the neglected infant, who died about twelve hours later. Death results in most cases of resection.

Intussusception is the cause of obstruction in from one-third to one-half of all cases in the very young. There are four types, the ileo-cecal being the most common. This was the only type seen by me. The condition is two or three times more frequent in males. One-half of cases occur under one year of age and most of the remainder under two years.

The symptoms may be mild at first and may not cause the parent much worry; the patient becomes suddenly ill, is seized with recurring attacks of abdominal pain and may show signs of early shock. The pain is usually diffuse and may be followed by vomiting, though early vomiting is not a constant symptom. Absolute constipation is not the usual rule. Diarrhea with blood stained feces or mucus is common. The blood stained passages are not always present and fecal vomiting is seldom seen. Vomiting is much less marked than in other forms of obstruction. The abdomen is soft at first but later may become distended and tender. Pain is a variable symptom and may be evidenced only by grunting sounds which accompany the tenesmus, or the patient may cry out.

A tumor is discoverable in the majority of cases, the mass being on the left side in 50 per cent of cases. The mass may be felt by rectum in about one-third of the cases. At times the symptoms may be so mild that the obstruction may be entirely overlooked if sufficient attention is not paid to the condition of the bowel movements and to the presence of a tumor. Differentiation must be made particularly from appendicitis, primary pneumococcic peritonitis (rare), and colitis; conversely colitis may be mistaken for intussusception.

SYMPTOMS OF OBSTRUCTION IN GENERAL

After obstruction is established, peristalsis is at first increased and an accumulation of fluids and gases form in the bowel proximal to the obstruction with resulting distension. This distension later results in loss of contractile power. This accumulation of material develops a very toxic substance which is no doubt formed by a changed intestinal mucosa and is nitrogenous in chemical composition. The outstanding symptoms are those found with hyperperistalsis elsewhere. Pain is described as being cramp-like or colicky. Location of the pain varies with the position of the lesion; pain is referred to the peripheral spinal nerves associated with the sympathetic nerve supply of the viscus affected. Thus pain of the small intestine or appendix is referred to the region of the umbilicus while that from the large intestine is felt in the mid-hypogastric region. The pain is referred and not in the part involved. Local pain may develop later when secondary peritoneal involvement has developed. As a rule, the higher the obstruction the more severe the symptoms. At first there is a definite interval between the severe attacks of pain, but these rest intervals tend to become shorter, and later the pain becomes almost continuous. Very soon after the onset of pain, vomiting begins. This vomiting is not toxic but mechanical. The vomitus will contain stomach contents, bile-stained fluid, and later some contents of the small intestine. Later, there may be a bowel movement with possibly bloody mucus. After this there is complete obstipation in the majority of cases.

The higher the obstruction the more violent the reaction, so that delay is all the more dangerous in this type of case. These cases do not show the classical signs of distension, fecal vomiting and other symptoms common to lower bowel obstruction, but are likely to be fulminating in type. Involuntary muscle rigidity is absent until sec-

ondary changes have taken place. It is well to remember that we do not find all the text book symptoms in any one case but there are symptoms common to all types, such as colicky pain, vomiting, toxicity, and later distension. The symptoms vary greatly according to the pathologic conditions found at operation.

Patients with large bowel obstruction may continue to have pain, late vomiting and distension for a comparatively long period compared to upper intestinal cases.

Analysis of a series of cases shows that practically all those having distension, fecal vomiting and cyanosis were seen after forty-eight hours of acute symptoms.

CONCLUSIONS

1. Acute intestinal obstruction is comparatively common and is met with rather frequently in general practice.
2. Delay is fatal and surgical intervention offers the only chance for relief.
3. Doubtful cases should be given the benefit of an exploratory laparotomy.
4. If one waits for the classical symptoms to develop, the patient has a relatively poor chance for recovery.

CASE REPORT

Mrs. .S., age 30 years, past history negative. One child three years old. First labor normal. Patient had been well since then. Second baby delivered Feb. 28, 1924. Normal, rapid labor. No handling. Normal for week, when fever and chills developed with pelvic infection. Baby developed erysipelas at this time. Infection cleared up though convalescence was very slow.

On July 17th this patient was again taken to a hospital with chills, high fever and evidence of acute pelvic infection. At this time a mass was present in the right groin with marked local inflammatory reaction, high fever, tenderness and fluctuation. It was now noted that the bowels were not moving normally and her condition soon became serious because of vomiting, obstipation, distension and signs of shock including very fast pulse and cyanosis. At this time the mass in her side was drained with the escape of pus and serous fluid. About twenty-four hours after this, feces were noticed on the dressings. This fecal discharge became copious and patient's condition improved but practically all bowel passages drained through wound. One or two attempts were then made to close the fistula from below.

She came under my care on August 17th. Pulse, temperature, urine and blood findings rather negative. All the feces drained through the fistula. Patient thin and general condition poor from malnutrition. Skin eroded and tissues angry looking around fistula. Condition improved somewhat until September 11th when operation was performed.

Abdomen was opened along outer border of rectus. A knuckle of bowel about thirty inches from the ileocecal valve was found adherent in the femoral canal. A section of bowel wall had sloughed off. Resection was done with end-to-end anastomosis. Portion of bowel in canal tucked down and covered with parietal peritoneum. Uneventful convalescence after the first twenty-four hours. Left hospital the thirteenth day.

February 18th hernial canal opened, cystic remnant of adherent bowel wall dissected out and femoral canal closed. Patient well since then.

REFERENCES

Moore, George Albert: Boston Med. and Surg. Jour., Dec. 24, 1925.

Mayo, Chas. H.: Jour. Am. Med. Assn. (1922), lxxix, 194-197.

Thompson, W. M.: Surg., Gyn. and Obst., March, 1926, p. 81 (acute abdomen).

Behrend, Moses: Surg. Clin. of No. Am., February, 1924, p. 163.

Hartwell and Hoguet: Jour. Am. Med. Assn. (1912), lix, 81.

"PABST EXTRACT—THE 'BEST' TONIC" NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Pabst Extract—The "Best" Tonic is claimed to be "pure extraction of malt, properly flavored and combined with hops and is preserved by no other means than pasteurization." The preparation is stated to contain alcohol, by volume, 3.70 per cent, and 1.45 gm. of hops are used for the preparation of 12 fluid ounces of "tonic." The Council found Pabst Extract—The "Best" Tonic unacceptable for New and Non-official Remedies because (1) the name does not indicate the potent constituents —malt and hops—of the mixture; (2) the claim "The 'Best' Tonic" is not warranted; (3) the therapeutic claims are unwarranted; and (4) it is sold to the public with claims that tend to its indiscriminate and ill advised use. (Jour. A. M. A., Nov. 20, 1926, p. 1760.)

ORGANOTONES

"Organ-O-Tones No. 19" is one of a series of "shotgun" pluriglandular mixtures marketed by the Cole Chemical Co. and "pushed" vigorously as an "obesity" remedy, largely by means of postcards which tell nothing of the ingredients of the preparation. The product is said to contain: "Thyroid substance," ½ Gr.; "Pituitary (whole)," ¼ Gr; "Phytolaccin," ½ Gr.; "Apocynum (P. E.)," ¼ Gr.; "Organ-O-Tones No. 12" (containing "Sodium Bicarbonate," "Potassium Bicarbonate," "Calcium Glycero-Phos," "Calcium Phos. (dibasic)," "Magnesium Phosphate"), 3½ Gr. The complexity of the formula is exceeded only by the obviousness of the conclusion that the "Thyroid substance" is the ingredient intended to do the business. Organ-O-Tones No. 19 is, in effect, just another of the dangerous thyroid "anti-fat" nostrums to which attention has recently been directed. (Jour. A. M. A. Dec. 25, 1926, p. 2179.)

A FATAL CASE OF TULAREMIA IN MINNESOTA*

LLOYD H. RUTLEDGE, A.B., A.M., M.D.
Detroit Lakes, Minn.

On Aug. 27, 1926, I was called to see what was later proven to be the first reported case of tularemia originating in Minnesota. This case terminated fatally. It was acquired in Becker County, Minnesota, near Detroit Lakes. Since that time, there have been other cases reported but so far as I know none of these cases originated within the territorial limits of Minnesota, but came into the State after the disease was acquired.

Before going into the details of this case, it is perhaps well to give a few of the general outstanding facts incident to this relatively newly discovered disease. The literature on the subject is fairly brief, the pioneer and principal contributor being Dr. Edward Francis, United States Public Health Service, Washington, D. C. Tularemia was first discovered by McCoy in 1910. He termed it a "plague-like disease of rodents" because the appearance of the lesions resembled bubonic plague in ground squirrels of Tulare County, California. The disease was named "tularemia" by Francis in 1921. The first part of the name was taken from the county in which it was discovered and the last part of the name signifies the presence in the blood of the causative organism. Dr. Francis defines it as follows: "Tularemia is an infectious disease caused by *Bacterium tularense*, found in nature as a fatal bacteremia of rodents, especially wild rabbits, and transmissible to man by the bite of an infected blood-sucking fly or tick, or by the lodgment on his hands or in his conjunctival sac of the internal organs or body fluids of infected animals or ticks."

Zoologic Distribution (according to Francis):

1. Rabbits—cottontail, jack and snowshoe—are the greatest source of infection. One case in Montana was reported from the bite of a coyote; another from the same place was caused by the bite of a gopher. The laboratory animals are generally susceptible to infection when inoculated experimentally.

2. Wood-ticks of the species *Dermacentor Andersoni Stiles* transmit the disease from rabbits to man; they also transmit the infection through their eggs to the next generation of ticks. They carry the infection over winter and harbor the disease throughout their lives and pass it on to the following generations of the tick family through their eggs.

3. Flies of the species *Chrysops discalis*, blood-sucking flies, that bite horses, deer, rabbits and man, may carry the disease from rabbits to man on the same day or on following days.

Distribution.—Human cases have been reported by the United States Public Health Service from the following twenty-three states: Utah, Wyoming, Idaho, Ohio, Indiana, North Carolina, Mississippi, New Mexico, Virginia, West Virginia, Montana, Texas, Oregon, Kansas, Iowa, Kentucky, Pennsylvania, Missouri, Tennessee, Georgia, Arkansas, Maryland and South Carolina. The last fifteen states have been added to this list in 1925 in the order given. Japan seems to have the same identical disease but it is known there as "O'hara' disease."

From these facts it is easy to see how man may come in contact with tularemia. During the spring and summer months the fly and the tick get in their work. The rabbit, however, comes in contact with the human throughout the year, as the hunter, housewife, butcher and farmer frequently handle these animals. The disease has been acquired frequently by laboratory workers. It affects both sexes, young and old, black and white with no apparent discrimination.

Etiology.—The cause of the disease is the *Bacterium tularense*. It occurs both as a bacillus and a coccus in both tissue and culture.

Pathology.—The pathology in the human has not been very well described. In laboratory animals it affects the lymph glands, the salivary glands, the liver, spleen and conjunctival sac. It produces small necrotic foci over the liver and spleen of an infected animal; these are discernible to the naked eye in sunlight on the cut surface of the organ.

Incubation.—The incubation period is from one to nine days, the average being three days as determined by Francis in forty-nine cases.

In two hundred and twenty reported cases, Dr. Francis classifies tularemia in three clinical types: (1) *Ulcero-glandular*, the primary lesion being a papule, later an ulcer of the skin and accompanied by enlargement of the regional lymph

*Read before the Minnesota State Board of Health, St. Paul, Minn., October 1926.

glands; (2) *Oculo-glandular,* the primary lesion being a conjunctivitis and accompanied by enlargement of the regional lymph glands; (3) *Typhoid,* without primary lesion and without glandular enlargement, this type runs a persistent fever.

Symptoms and General Description.—The onset is sudden with headache, vomiting, chilliness, chills, aching bodily pains, prostration and fever. About forty-eight hours after the onset, the patient complains of pain in regional lymph glands and about twenty-four hours later may complain of pain at the site of infection. The site of infection shows a swollen, inflamed papule which breaks down to an ulcer about three-eighths of an inch in diameter and leaves a punched-out appearance. Red streaks may be visible on the extremity. In about half of the cases the glands break down and suppurate. In the other half of the cases they remain hard, palpable and rather tender for two or three months, gradually subsiding. The disease may run a number of weeks. The onset and duration in the three clinical types is much the same, except of course in the oculo-glandular type the conjunctiva is involved, while in the ulcero-glandular type there is a papule, and in the typhoid type there is persistent fever with no local symptoms.

Prognosis.—Out of two hundred twenty cases reported by Francis, seven terminated fatally.

Treatment.—No specific serum has been reported, which leaves the treatment entirely to the physician in charge to treat the various symptoms as they arise.

REPORT OF CASE

The patient was first seen on the afternoon of August 27, 1926, at her home about three miles from Detroit Lakes. She was a married woman, fifty-eight years old and her family history was unimportant.

The past history showed her to be the mother of seven children, six of whom were living and well. One had died from scarlet fever and its complications. In the main she had always been strong and well and had done a great deal of hard work at her duties of a busy housewife. There had been no past illness of any consequence, with the exception of three widely separated attacks of upper abdominal pain and on one occasion a physician had diagnosed the condition "gallbladder disease." About two weeks previous to her last illness, she fell down a flight of cellar steps and suffered a considerable contusion of the right lower chest and upper abdomen. At this time she stayed in bed three days but was then up and attending to her housework, although she suffered some pain in the upper abdomen until the final illness began. Just previous to this incident, she had taken a motor trip in the northern part of the state and in diagnosing her sickness this trip suggested the possibility of typhoid fever.

Last Illness.—The 21st of August, 1926, she dressed a young cottontail rabbit. This animal was shot near her home by her husband and was later eaten by the family. In cleaning the rabbit she sustained a small cut on the dorsal surface of the left thumb just over the phalangeal joint. The night of August 26th, she did not feel very well upon retiring but arose August 27th, and began the usual household routine. About noon she became very ill, had a severe headache, vomited large quantities of bile, suffered general pains all over the body, and rather severe abdominal distress and went to bed at noon with a temperature of 102.4, pulse 120, respiration 24.

Physical Examination.—A large muscular well developed woman, lying in bed breathing rather uneasily, face flushed, temperature 103, pulse 120, respiration 24. Eye reflexes normal, pharynx red but only slightly inflamed, but no conjunctivitis. The chest showed a few râles over the bases of both lungs but percussion note normal. The heart presented a soft mitral systolic murmur and was slightly enlarged to the left, rhythm irregular, blood pressure 120/75. The abdomen was moderately distended with a small degree of upper abdominal tenderness, more pronounced on the right, but no definite muscular rigidity.

The dorsum of the left thumb showed a small laceration, which was mildly inflamed.

Clinical Course of Disease.—The general appearance of the disease was very similar to typhoid fever. The temperature ranged mostly between 102 and 105, averaging about 103, with no particular regularity as to the rise and fall. The pulse was more rapid than the usual typhoid pulse. There was nausea, vomiting, headache, nosebleed, high fever, light chills, and extreme prostration. The cut on the dorsum of the hand showed pus on the third day of the disease, and two days later a mild lymphangitis. The epitrochlear was slightly palpable, one or two axillary glands were palpable and slightly tender; they were about the size of a large bean. The infected cut developed an ulcer, less than a half-inch in diameter; it had an irregular motheaten appearance, was rather superficial, but refused to heal when treated with mercurochrome. The white blood count varied between 5,000 on the second day and 12,500 on the fourth day, usually showing no leukocytosis. There was a small amount of albumen in the urine.

On the sixth day a papular eruption began to develop. This was progressive during the second week of the disease and on the twelfth day about two dozen papulo-pustules were found distributed over the chest, back, abdomen and thighs, very superficial in their location.

The patient was treated as typhoid fever but refused to improve. On the seventh day she became semicomatose, the prostration increased and the prognosis was then considered very grave. This was followed by a temporary remission of temperature, but on

the eleventh day the temperature and pulse both rose, her condition becoming gradually worse until she died on the fourteenth day.

Laboratory Tests.—White blood counts on the second day, 5,000; fourth day, 12,500; sixth day, 7,000; seventh day, 7,500; and twelfth day 7,800.

Widal negative on second, fourth, sixth, ninth and eleventh days.

Urine showed albumen and hyaline casts.

Urine and stool negative for typhoid and paratyphoid on the twelfth day.

Blood culture on the sixth day showed no growth.

Blood collected just after death from the brachial vein was forwarded, with a request for examination for tularemia, to the Hygienic Laboratory, United States Public Health Service, Washington, D. C. The report stated that the serum agglutinated *Bacterium tularense* in all dilutions from 1:10 to 1:320, but not in higher dilution, thus confirming the diagnosis of tularemia.

A later report stated that the blood clot injected into a guinea pig caused its death on the sixth day, with the typical lesions of tularemia, and that *Bacterium tularense* had been cultured from the pig. On September 23rd, a young cottontail rabbit was found dying near the patient's home. The liver, fixed in formalin, was sent to the Hygienic Laboratory, and the report was made that the characteristic small white nodules of tularemia were visible on the surface of the liver in strong sunlight, and especially with a hand lens. A second rabbit found dead in neighborhood of the patient's home and sent to Dr. McDaniel of the State Board of Health for postmortem and study showed the characteristic lesion of tularemia and likewise produced the same lesions in the inoculated guinea pig. Several other rabbits have been found dead in the same region during the summer.

Diagnosis.—Two consultants were called, Dr. Merriam of Duluth on the sixth day and Dr. Long of Fargo on the twelfth day. Typhoid or paratyphoid fever was regarded as the most likely diagnosis; septicemia was also considered; both consultants thought of tularemia. Finally, after the consulatation with Dr. Long a telephone conversation was held with Dr. Merriam and it was thought best to send a specimen of blood to the Hygienic Laboratories to see if the diagnosis could be made. At this time the condition of the patient was quite critical and the blood was refused. The blood was finally obtained when the brachial vein was opened for embalming. The Hygienic Laboratories found the agglutination test positive and were able to produce the characteristic lesions of tularemia by injecting the remaining blood clot into a guinea pig. The work on the rabbits further confirmed the diagnosis.

Summary.—1. This case of tularemia was acquired from a young cottontail rabbit.

2. Clinically, the case may be confused with typhoid fever. The diagnosis is made by absence of the Widal and a positive agglutination test for *Bacterium tularense.*

3. At least some of the rabbits near Detroit Lakes have the disease and may be a source of infection to the human.

BIBLIOGRAPHY

1. Francis, Edward: Tularemia Francis, 1921, Hygienic Laboratory-Bulletin No. 130.
2. Francis, Edward: Tularemia, reprinted from Annals of Clinical Medicine, Vol. iv, No. 1, July, 1925.
3. Francis, Edward: Tularemia, reprinted from Proceedings of the Institute of Medicine of Chicago, 1926.
4. Freese, H. L., Lake, G. C., and Francis, Edward: Four cases of Tularemia (three fatal) with Conjunctivitis, reprint No. 1064 from the Public Health Reports, February 26, 1926.

Note: I am greatly indebted to Dr. Francis of Hygienic Laboratories, and to Dr. McDaniel of the State Board of Health, for their laboratory tests.

GOITER PROPHYLAXIS WHERE THE INCIDENCE OF GOITER IS LOW.

A recent survey of goiter in Connecticut by experts of the United States Public Health Service indicates that the situation there is one that, in the opinion of the government consultants, does not call for the institution of state-wide goiter prophylaxis through the use of iodized water supplies, iodized table salt, or wholesale distribution of tablets containing iodine. The surgeons of the United States Public Health Service believe that prophylactic measures should be carried out among girls between the ages of 11 and 16 years, under the direction of local health authorities, guided and assisted by the state department of health and the local medical practitioners. The prophylactic methods chosen appear to be immaterial provided there is skilled supervision, low dosage of iodine, regularity and economy of administration. (Jour. A. M. A., Nov. 27, 1926, p. 1832.)

COD LIVER OIL EXTRACTS

The available evidence points against the efficiency of the products that have been included in the cod liver oil extract category. Vitamins A and D, in which cod liver oil abounds, tend to dissolve with readiness in fats or fat solvents. The so-called extracts are usually at best weak alcoholic fluids of very doubtful solvent power so far as the vitamins referred to are concerned. The malt extracts that may be incorporated with the proprietary mixtures may have potencies that cannot, however, be identified with the specific characteristics of the cod liver oil. Recently, vitamin concentrates have been prepared from cod liver oil by saponification of the latter, the potent substances being contained in the non-saponifiable fractions. Such a cod liver oil concentrate has been accepted by the Council on Pharmacy and Chemistry. (Jour. A. M. A., Dec. 11, 1926, p. 2019.)

NOTES ON EPIDEMIC ENCEPHALITIS*

C. EUGENE RIGGS, M.D.
Professor Emeritus of Nervous and Mental Diseases,
University of Minnesota
St. Paul, Minnesota

Thirty-five years ago, says Agnes Repplier, Andrew Lang, in a clever brochure entitled "How to Fail in Literature," warned young writers that there was nothing more to be written on the subject of Abraham Lincoln. This great American would ever be a matter of interest to an English speaking world but as a topic for magazine papers his day was over. In the past decade, says this gifted author, Poole has indexed more than three hundred magazine articles. Of scattered papers and editorials there is no limit and on the 12th of February, American poets become laureates and sing his deathless fame.

So great during recent years has become the literature of epidemic encephalitis that one might say with Andrew Lang there was nothing more to be written on this subject. Nothing could be farther from the fact. Its symptomatology is greater than that of syphilis. Of all diseases it is most protean in its manifestations, greatly surpassing hysteria in its power of simulation, in its milder phases frequently being mistaken for it.

The purpose of this paper is to call attention to some of the expressions of its many-sidedness, to note some recent forms of therapy and to emphasize its economic and sociologic significance.

The diagnosis of organic brain disease is much more difficult than it was before the epidemic of 1917, because, as Burr explains, of seemingly new and certainly unfamiliar clinical pictures which one is constantly seeing. So atypical has epidemic encephalitis become in its manifestations that no longer can the dagnostic criteria, fever, headache, diplopia and somnolence be depended upon in reaching a diagnosis. I have recently observed a case run a stormy course without the slightest evidence of temperature, and it is a matter of common observation that the sequelæ may appear without any preceding recognizable illness. Burr reports the occurrence of five cases of gradually developing Parkinsonianism without any distinct acute attack.

This unwelcome guest of the past nine years —an ever present menace to the community—has long outstayed his welcome and as yet shows no inclination to take his departure. Crookshank traces the disease back to the days of Hippocrates and shows that during the last 450 years there have been a number of epidemics in various countries of Europe. Gullan states that thirty years prior to 1917, isolated cases have been described, while the character of the disease was unrecognized. It is estimated that 20 per cent of the lethargic and 30 per cent of the hyperkinetic types die. Schultz and Stern, of Göttingen, estimate that in the province of Hanover alone from 1918 to the middle of 1924, there were a thousand cases of epidemic encephalitis and that approximately four hundred patients passed into the chronic stage. Familiarity must not breed contempt regarding the contagiousness of encephalitis. The disease is definitely contagious even in the chronic form. Guillain reports a case of what he calls contagious tardy epidemic encephalitis of Parkinsonian type. A man, aged 22, was allowed to sleep between two patients with post-encephalitic Parkinsonianism and contracted a typical lethargic encephalitis. He advises isolation of these patients and a warning of their friends that contagion is possible. In addition to this patent of Guillain's, White and Freeman have collected from the literature six other cases of infection occurring in the chronic stage or during acute exacerbations. An encephalitic case, a teacher, now under our care, had in her classes two pupils whose father was ill with lethargic encephalitis. Similar cases are noted in the literature. The spread of the disease by "carriers" would seem to be most probable. Stallybrass has reported a few instances of severe infection occurring in institutions. Guillain observed last year four instances of more than one patient in a family affected with this disease. Hall reports the case of a woman who developed encephalitis two weeks before her confinement. The child, at birth, was lively, active and well. Placed at the breast, it became torpid and somnolent. After weaning, it recovered immediately and remained well. He quotes another case in which the child became infected and died. McNally reports the occurrence of twelve cases in a building housing twenty-two

*Read before the Douglas County Medical Society, Superior, Wisconsin, May, 1926, and the Minnesota Academy of Medicine, November 10, 1926.

people. Kling and Liljenquist report that in 1921 encephalitis was prevalent in certain villages of Lapland; that in some families several members contracted the disease simultaneously and in two houses almost all the inmates were affected. Marie cites an instance of two sisters suffering from the disease. Netter has seen three children occupying the same room, all affected with encephalitis. In an outbreak in an asylum at Mulheim in 1922, observed by John and Stockebrand, there occurred twenty-eight cases with thirteen deaths. At Eastbourne, England, in July, 1923, three brothers and a sister were attacked one after another with encephalitis. Jorge has seen it contracted from visiting a friend. Reese and Bassoe cite instances of nurses contracting it. Van Boeckel states that in West Flanders, out of twenty-six cases in four closely interrelated families, seventeen developed encephalitis and four died. Petren says that observations in the most northern part of Sweden showed that epidemic encephalitis was a true epidemic disease. It was observed to spread from house to house. In this same section the same observation was made regarding poliomyelitis.

Out of 2,483 doctors who died in this country in 1925, six died from epidemic encephalitis. Martyrs to their profession, their names should be added to those of Jesse W. Lazear, Howard T. Ricketts and Arthur W. Bacot: "Selfless souls," says A. H. Smith, "who have given not only their efforts but their lives in the struggle for mastery over ignorance and disease."

SYMPTOMS

Recent observation teaches that in a suspected case of encephalitis it is not the classical symptoms one should keep in mind but the unusual ones. Rashes, when present, occur early and during the pyrexial stage. Usually they disappear within twenty-four hours. The eruption may be petechial, papular, morbilliform, scarlatiniform or erythematous (McNally). Headache, a cardinal symptom, may be occipital, frontal or the entire head may be affected. Occasionally the pain is localized in or about an eye. This is quite distinctive of encephalitis. Headache may constitute the outstanding symptom long after the initial illness. It is of great severity and occurs irregularly. A patient said to me she would commit suicide, if it were possible, during a paroxysm, to escape the agonizing pain. The pain may occur at the onset of the disease or at a later stage. Rare points of its manifestation are the axilla and the perineum (Robb). Severe pain in the gums and cecum has been observed by Hunt. One of our cases developed a typical multiple neuritis with paralysis and atrophy of the muscles of both upper and lower extremities. The pain was very severe. In one of Dr. Sturre's* patients, a boy of four years, the outstanding symptom for five weeks before he was consulted, was pain in the legs, which prevented walking. It lasted for an hour or so, then ceased only to return later. Two cases of my own complained bitterly of pain in the neck muscles; later this was followed by their paralysis with complete loss of the head movements; the head would fall forward and backward, from one side to the other, the patient being absolutely unable to control it.

In a previous paper, I have called attention to epidemic encephalitis simulating acute surgical lesions of the abdomen. Last winter an acute encephalitic complained of severe abdominal pain with tenderness and occasional vomiting. Fearing an acute abdomen, I had Dr. Arnold Schwyzer see her. His findings were negative. In 1919, Bassoe saw a child whose appendix had been removed. The diagnosis of encephalitis was confirmed by autopsy. Dr. Stevenson reports four cases admitted to the hospital as acute abdominal disease. Three were definitely cases of encephalitis. The fourth was operated upon for appendicitis. The appendix was found to be normal. Because of the obscure symptoms no definite diagnosis was made. The history was clearly that of an encephalitis. Dr. Howell states that he has seen encephalitis diagnosed as appendicitis and that a similar mistake sometimes is made in poliomyelitis.

The interesting observation that personality changes may precede the appearance of unmistakable symptoms of encephalitis has been made by Dr. Massant. Cranial nerve palsies are regarded as of great diagnostic importance, yet frequently they are wanting. Diplopia may be the earliest symptom; usually it does not appear until the second or third day; it may disappear within a few hours; it may be so transient that the patient forgets that it has ever been present. Only persistent interrogation

*Personal communication, Dr. J. R. Sturre, Watkins, Minn.

elicits this fact. Ocular palsies, the most important of Netter's triad—fever, somnolence, ocular palsy—may last from a few hours to six months. There is a small residual of these that are permanent and may greatly cloud the diagnosis, frequently being mistaken for tabes, paresis and myasthenia gravis. Ptosis and nystagmus are common symptoms; external and internal ophthalmoplegia occur; the latter may be the only ocular symptom. The pupils may be small, dilated, unequal, or they may present the Argyll-Robertson syndrome; they may fail to react to light or accommodation. Failure in accommodation is of diagnostic significance. Hemorrhages, papilledema, choked discs and hemianopsia have been observed. According to Gordon, the early appearance and persistence of diplopia, ptosis and the Argyll-Robertson pupil indicates lues rather than encephalitis. The 5th, 7th and 12th nerves may be involved. Deafness occurs but rarely persists. Yawning is of common occurrence in organic brain disease. Hunt reports an extreme manifestation of it in a case of epidemic encephalitis. For two or three weeks the patent yawned from three to five times an hour while awake, less frequently during sleep; yawned immediately if aroused. Three times he dislocated his jaw. Tucker, in 1918, discussed the involvement of the pituitary body in encephalitis; polyuria is common. A patient of Robb's passed from 500 to 600 ounces of urine daily. This ceased after lumbar puncture. Garrett and Gutman's patient passed ten liters daily for ten days (Hunt). Paulin reports the voiding of 12,000 c.c. of urine in 24 hours by a young man who four years previously had had an attack of encephalitis. Diabetes insipidus must be recognized as a sequel, although no lesion of the hypophysis has as yet been found. Foster Kennedy, Mackfee Campbell and Sanborn have reported cases. Pardee cites an unusual case of abnormal tongue movements as a sequela of encephalitis. The mouth would open, the tongue protrude and manifest choreathetoid motions. Several months prior to these there had been chewing movements. Hunt states that he has seen the report of six similar cases—four in French and two in German literature. Abrahamson has observed six similar cases in which the movements were not so pronounced.

The onset of encephalitis may be insidious or cyclonic in character. It may assume the garb of any known form of nervous disease. In three of my patients it camouflaged an involutional depression, a neurasthenia and a disseminated sclerosis.

Several years ago, A., in his fiftieth year, consulted me, complaining of insomnia, of a fear that something dreadful was going to befall him. He was depressed and occasionally in conversation would use the wrong word. There were no objective nervous symptoms. Some weeks later he developed delusional ideas, persecutory in character. There was no fever, no ocular palsy, no somnolence. The serologic findings were negative; then a rise of temperature occurred and the symptoms no longer permitted of doubt as to their encephalitic character. The disease ran a rapid course, the patient dying within a week after the rise of temperature.

Miss E., a young woman 30 years old, consulted me for "nervousness." There had been no definite illness. Two deaths in the family greatly distressed her. She tired on the least exertion, was irritable, unreasonable; lacked initiative; she slept badly, was greatly terrified by dreams; neurological examination was negative. Suddenly the smoldering infection of nine months' duration flamed into the most acute and distressing phase of encephalitis I have ever seen. There was great pain in the head, neck, abdomen and both upper and lower extremities—evidently a neuritic phase of the disease; vision was blurred; she was greatly distressed by terrifying hallucinations of sight and hearing. These especially worried her because she feared she was becoming insane. There was double Kernig; she lost control of her head movements. The head would fall forward, backward, to one or the other side as gravity determined. She lost all power in her hands and for weeks had to be fed; for many weeks she was unable to stand on her feet. Gradual improvement occurred and, when seemingly convalescing, the acute symptoms returned in great intensity; her suffering was greater, she said, than during the first attack. She again became convalescent and recovery occurred.

Mrs. H., aged 35 years, gave a definite encephalitic history. She is a Parkinsonian. There is a distressing sialorrhea; her staccato speech, intentional tremor, exaggerated reflexes, ankle clonus, weakness and ataxia are those of a typical disseminated sclerosis. The multiple sclerosis syndrome is an accredited sequela of epidemic encephalitis.

SEQUELÆ

The post-encephalitic respiratory syndrome, unfortunately, is too well known. The dyspnea associated with it differs radically from that seen in the respiratory cardiovascular disorders, the toxemias and the Cheyne-Stokes respiration. So bizarre are its manifestations that some of its phases have simulated a clear-cut hysteria. This

sequela may occur months or more than a year after the acute attack.

Gamble reports a most unusual case in which there was a post-encephalitic tic of the diaphragm, where rapid chest movements with slight excursions of the thorax had been mistaken for respirations, tending to follow the frequently repeated tic, which occurred between 60 and 90 times a minute; the chest movements varied from 36 to 70 times a minute.

There is no symptom of disease more common than hiccup, so common as to be trivial, many times regarded as a joke—sometimes, as in alcoholism, it is an object of sarcastic humor—yet it may possess a grave significance, at times, as in pneumonia and typhoid fever, causing death. It may usher in an attack of encephalitis, complicate its acute phase, or, as in the case just cited, constitute a distressing sequela. The first appearance of epidemic hiccup occurred in Vienna in the winter of 1919-1920 (Economo). Large numbers of people were suddenly attacked with uncontrollable and almost incessant hiccup, which resisted all treatment. Usually after several days or a week it ceased spontaneously. In many cases the patient hiccuped as frequently as every three or four seconds. In one instance, the hiccup lasted for a month, there being only a few hours respite each day. About 1921 it became epidemic in this country. This epidemic seems to have been associated with the outbreak of epidemic encephalitis. Lhermitte believes there was a causal connection between these two diseases. French clinicians, notably Netter, share this view. Sir John Robertson, health officer, Birmingham, 1924, believes that epidemic hiccup may be a symptom of encephalitis of a mild type. In Brain's patient, for a month there were intermittent brief attacks of hiccup; then the typical symptoms of lethargic encephalitis, with ocular palsies developed. This case, he believes, establishes finally the relationship between epidemic hiccup and epidemic encephalitis. The experiments of Rosenow give much support to this close relationship. Cadham reports two epidemics of hiccup in Winnipeg; 2,400 cases in all. Ninety per cent of the patients were males; there were no deaths. The chief characteristics were intermittent muscular spasms, neuritis, slow pulse—never over 75; normal and subnormal temperature.

SPINAL FLUID

Blood in the spinal fluid is not an unusual occurrence; it is a symptom arising from many and various causes and of itself possesses no distinctive diagnostic significance. It does not mean a distinct clinical entity—that is, it has no constant and uniform base. As well make of fever an entity, which is a symptom only of most diverse pathological conditions. Meningeal hemorrhage—blood in the space between the arachnoid and the pia mater, which is normally occupied by the cerebrospinal fluid—when not due to trauma but resulting from a rupture of a meningeal vessel or an aneurysm (frequently congenital), is called spontaneous subarachnoid hemorrhage. Why a pia-arachnoid hemorrhage, with its attendant meningitic syndrome arising from varied causes should be dignified as a clinical entity instead of being regarded as a symptom common to different diseased conditions, I can see no adequate reason. Why meningeal hemorrhage in epidemic encephalitis—an infection recognized to have a special predilection for the cerebral vessels—should be classed as spontaneous subarachnoid hemorrhage passes my comprehension. Serous meningitis can give a clinical picture similar to that of spontaneous arachnoid hemorrhage, differentiation being possible by lumbar puncture alone. It is the site of the hemorrhage or accumulation of spinal fluid in the pia mater and arachnoid arising from a great variety of causes, many known, others unknown, which gives rise to a fairly well defined syndrome. The cardinal characteristics of so-called spontaneous meningeal hemorrhage are—the location of the accumulation of blood or spinal fluid, the vague and ill-definied symptomatology and the diverse and manifold pathology—a neurological wastebasket. The appellation spontaneous meningeal subarachnoid hemorrhage is a misnomer. Spontaneous hemorrhage is as inconceivable as spontaneous generation. The concept is unscientific and absurd. Blood in the spinal fluid should be regarded as a symptom pure and simple—a symptom absolutely lacking in distinctive diagnostic significance.

Hemorrhage in encephalitis, epidemic and non-epidemic, is a well recognized symptom and not so rare as commonly supposed. During the year extending from December 31, 1923, to December 31, 1924, thirty-two cases of epidemic en-

cephalitis were admitted to the Boston Psychopathic Hospital. Three of these patients showed xanthochromia—9.38 per cent—a symptom of relatively frequent occurrence. The mental symptoms in these three cases greatly overshadowed the physical ones, which indicates, Dr. Rothschild suggests, that xanthochromia is more likely to occur in those cases in which the mental symptoms are especially prominent. Within the past six months I have come in touch with three patients suffering from the hemorrhagic form of epidemic encephalitis. Of these, the most interesting was the patient of Dr. Hensel, who two years before had experienced an apparently similar attack, the blood in the spinal fluid being a marked feature of both illnesses. Recrudescence in epidemic encephalitis, as in disseminated sclerosis, is a well known fact and may occur repeatedly after an interval of months or years following the initial illness, being due probably in both instances to the variations in the activity of the infecting organism. Before the days of lumbar puncture, there died in my service at the City and County Hospital, a young woman, supposedly from chorea. Autopsy showed both the gray and the white matter of the brain dotted with small hemorrhages. Lumbar puncture would undoubtedly have shown a bloody spinal fluid. Farquhar Buzzard believes that in epidemic encephalitis the virus has a specific affinity for the cerebral vessels and that grave vascular accidents are more common in this form of encephalitis than in the other encephalitides. Remarkable changes have been found in the vessels, characterized by hyaline and calcareous degeneration of the vessel walls, confined largely to the media and adventitia. The hemorrhages, thromboses and infarctions incident to the acute stage will explain, he believes, many of the symptoms. The progressive deterioration frequently observed in these patients is undoubtedly due to the precarious nutrition of the brain tissue resulting from the degeneration of its vessels.

NARCOLEPSY

Encephalitic narcolepsy is an unusual but a well recognized sequela of epidemic encephalitis. Frequently it is mistaken for lethargy; short attacks of sleep occurring several times during the day may follow encephalitis. These may disappear after a few weeks (Redlick). Narcolepsy is of rare occurrence. I can recall only two cases in my professional experience. Two years ago I had a patient who would fall asleep frequently during the day. A restful night did not lessen this tendency. The sleep was apparently normal. She had an expressionless face and there was marked asthenia. There was a clear history of an encephalitic attack. Following excitement, she did not complain of a sudden weakness extending to the lower limbs, as is common in these cases (true narcolepsy). In Perrier's two cases, narcolepsy occurred soon after an attack of epidemic encephalitis. There were from twenty to thirty attacks in a day. Redlick and Stiefler have observed a typical narcolepsy in encephalitis (Spiller). Spiller could trace no definite relation in his three cases of narcolepsy to encephalitis, but knowing that this post-encephalitic syndrome may at times be the only sequela, such a presumption in his and similar cases would seem to be justifiable.

PARKINSON SYNDROME

In the epidemic of encephalitis in Japan in 1924, the Parkinson syndrome was rare and eye symptoms seldom occurred. In 25 per cent of the cases of epidemic encephalitis, the Parkinson syndrome occurs (Hall). It may develop months and years after the initial illness, the patient in the meantime being in excellent health. There is a sharp contention among neuropathologists as to whether the globus pallidas, the substantia nigra, the other portions of the extrapyramidal system, or the entire central nervous system, is the seat of the lesion essential to the production of the so-called "Parkinsonian states." Souque believes that ordinary paralysis agitans is not a morbid entity but a syndrome common to different causes which affect the same cerebral region. In his opinion, it is not so much the nature of the cause as its situation; the site is almost everything. In both paralysis agitans and the Parkinson syndrome due to encephalitis, the cells of the pallidum and the substantia nigra show atrophy. The similarity of the clinical symptoms at times in these two diseases is not, therefore, surprising. Spiller states "that there are cases of post-encephalitic Parkinsonianism which no one could mistake for the true paralysis agitans where there are complications such as the upward spasm of the eyes and head. There are cases with onset late in life, with the characteristic features of true Parkinsonianism, which one can be reasonably certain are of the true type, but

there are other cases in which I am utterly unable to be certain which form is present. The site of the disease undoubtedly is of great importance in the production of the symptoms and the pathology may vary; true Parkinson probably is degenerative; encephalitic Parkinson is inflammatory." The researches of McKinley and Gowan indicate that the substantia nigra is the site of the lesion; the neuron decrease in this area varied from 58 per cent to 87 per cent, there being only minimal changes in the globus pallidus. Scattered lesions in other portions of the brain were so insignificant as not to warrant investigation. So far as their three cases were concerned, the substantia nigra appeared to be the essential factor in the causation of the syndrome. Hassin and Bassoe place the lesion in the extrapyramidal system, chiefly in the basal ganglia and the substantia nigra. They regard the "Parkinsonian states" as distinct pathological entities. Hohman says that although the clinical features of encephalitic Parkinsonianism may be said to be indistinguishable from those of paralysis agitans, yet the pathologic process in the two conditions is entirely different and is "a chronic progressive degenerative inflammation of the central nervous system." Byrnes states that the Parknsonian states are often accompanied by a lesion in one or more of the basal ganglionic structures; that it is impossible to determine the exact location of the lesion and that "the pathological and clinical identity of the two diseases is not yet universally recognized." The neoropathological findings show no unanimity of opinion as to the location of the pathologic process.

Parkinsonianism shows certain distinctive characteristics. The increased muscular tone gives rise to postural changes characteristic of this condition. Such abnormal postures in a normal person would be exceedingly tiresome but these patients seldom complain of undue fatigue. Tremor is not so constantly present as in paralysis agitans proper and sometimes, as in this latter disease, is entirely absent. The Parkinson syndrome may be very incomplete; frequently it is limited to the face or an arm or it may assume the hemiplegic type. The latter is quite common and the prognosis in these partial cases I have found much more hopeful than when the entire musculature of the body is affected.

OCULAR MUSCLE INVOLVEMENT

Hohman has observed as a sequel coming on from one to six years after the initial encephalitic attack an involuntary turning up of both eyeballs for several minutes or hours at a time. This symptom was not supposed to exist outside of hysteria until 1924, when similar cases following encephalitis were reported by three different German writers (Bassoe). In two of our cases there was a temporary tonic spasm of the superior rectus and inferior oblique and of the inferior rectus and the superior oblique. The turning of the eye upward movement predominated. Pressure over the supra-orbital notch relaxed the spasm, which lasted from a few minutes to several hours. Gordon cites two similar cases. Dr. W. W. Lewis has most kindly called my attention to the following two cases of vertical nystagmus with fixation phenomena, reported by Dr. Perkins in the American Journal of Ophthalmology, August, 1926. These patients were characterized by vertical nystagmus and fixation of the eye upward, coming on many months after an attack of epidemic encephalitis. He states Fischer has described a similar condition in five cases, Ewald in five, Myers in two and Hohman in four. In the first patient the nystagmoid movements began two years and four months after the acute illness, and preceded the holding attacks eight months. In the second, the nystagmoid movements began two years and six months after the initial sickness, while the holding attacks began four months later.

VARIOUS SYMPTOMS

Superficial and deep reflexes may be increased; unilateral Babinski is common; ankle and knee-clonus may or may not be present. There is marked fatigability of the reflexes (Hunt). Sialorrhea is frequently a distressing symptom. The tongue in this syndrome has received scant attention. It is a diagnostic factor of great importance in the early stage. Usually it is coated, swollen and flabby. If not coated, it may be angry-looking, dry and cracked, "typhoid-like." In one form or the other a foul tongue is practically always present (Reynolds). The pulse is increased; averages 100. The failure in muscular power is less than in ordinary paralysis agitans. Impulsive tendencies may be present. Young patients show marked personality changes, *i.e.*, irritability and loss of emotional control. Adults may be subject to spasmodic crying and laughing, to depression, apathy, euphoria simulating that of paresis. These symptoms are more common in

the female. Parkinsonianism manifests paradoxical characteristics—the so-called "kinesia paradoxa." Howland (Toronto) told me of a patient of his with marked Parkinsonianism, who, if placed on a bicycle, rode with ease, expertness and dash. The getting on and off the bicycle was a matter of some difficulty. Also of another patient whose muscular rigidity was completely relieved for some hours if given a good drink of whisky. One of our patients, absolutely helpless, requiring constant care, sometimes after awaking from sleep would temporarily be free from all increased muscular tone; he would walk around the room, telephone, talk normally; then again relapse into his Parkinsonian shackles. One of Dr. Hengstler's cases would walk or run quite naturally if she accelerated her movements. Hall reports the case of a young man, quite helpless, who after a sea bath would sprint along the beach as if he had never been ill, only to return to his state of immobility. Recently I saw an elderly patient who had been in a streetcar accident; previous to its occurrence, she had been in her usual health. Immediately afterwards she developed a typical Parkinsonian syndrome. In the ordinary paralysis agitans and in neurosyphilis, it is well known that trauma will unmask a latent condition awaiting opportunity for development.

PROGNOSIS

Some Parkinsonians die within a few months. The young manfest no more recuperative power than those more advanced in life. According to Howell, the early occurrence of this syndrome in the acute attack clouds the prognosis. Most commonly the disease becomes stationary, leaving the patient a helpless and permanent invalid. In a small proportion of cases, improvement takes place even in patients who for a long period have been bedridden and helpless.

Every case of epidemic encephalitis shows some disturbance of the psyche, be it ever so slight. There is an anatomical and physiological reason for the great difference in the nervous and mental symptoms seen in the child and adolescent on the one hand and the adult on the other. The new-born child is an automaton. The nerve cells necessary to life predominate in function. Following life's ageless patterns, the dendrites and axis cylinders grope their way along their predestined paths until the 18th year, when the marvelous artistry of the nervous system is achieved. Of the countless millions of brain cells, each has found its anatomic relationship. Having antomically arrived, for the next seven years —the completion of adolescence physiologically speaking—the nervous system has to find itself; nerve courses have to be charted, nerve currents have to find their appointed channels. Encephalitis occurring during this period, before the mechanism of the nervous system is anatomically, physiologically and psychologically perfected, is a grave cerebral disaster. The ill effects following such an infection may be tragic, far-reaching and largely irremedial. The personality of the child and adolescent is often metamorphosed by the virus of encephalitis. Incorrigibility, obscenity, lying, stealing, suicidal impulses, sexual abnormalties, phobias, hysterical manifestations, extreme irascibility, sleeplessness, changing night into day are recognized sequelæ. Freeman (Washington) believes that the causative agent in epidemic encephalitis persists long after the subsidence of the acute attack—that the term post-encephalitic disorder is a misnomer—that the so-called sequelæ are due to a continuance of the infection just as much as patients with dementia paralytica are suffering from a persistence of the spirochete. In the acute stage of epidemic encephalitis, the mental symptoms usually are the same as those common to toxic infectious disease, lethargy, stupor, coma, delirium and mental confusion; the two latter symptoms are rarely absent (Kidby). The delirum in encephalitis ofttimes resembles that of delirium tremens; occupational delirium and talkativeness are more common than in the other toxic conditions. Dr. Folsom has shown that more than 85 per cent of the cases suffering from the post-encephalitic psychoses in the Manhattan State Hospital present a clinical picture of emotional instability, plus disorders of behavior and delinquency. His findings indicate that the main clinical expression in encephalitis is marked and often lasting disturbance of the emotional mechanisms. The "emotional stupor" described by Kennedy is a definite inhibition of effect as seen in lethargic and stuporous phases of the disease.* The grave psychotic reactions such as the schizophrenic syndrome, the manic-depressive psychosis and paranoid states occur but not as frequently as commonly supposed. An encephalitis occurring during the course of a dementia precox or a manic-depressive psychosis

*Archives of Neurology and Psychiatry, April, 1926, Page 518.

does not in any way modify the familiar symptomatology of these affections. The explanation of these more complex psychotic reactions is to be found, Kirby believes, in the underlying personality and the psychologic make-up of the individual. Notwithstanding the abnormal emotional instability in encephalitis, the higher psychic functions are well preserved. The mental deterioration and dementia present in other organic brain diseases are wanting in this disease.

SPINAL FLUID

The blood changes in epidemic encephalitis possess no striking significance—a moderate leukocytosis, the total count varying from 10,000 to 12,000. The spinal fluid findings are, however, of great importance. The test of the sugar content has a certain diagnostic value. Readings above the normal are the rule. This increase of glucose can in no way be considered pathognomonic. MacPherson reports a case in which the clinical picture was similar to that of a tuberculous meningitis or an epidemic encephalitis; because of the high sugar content in the spinal fluid a diagnosis of encephalitis was made. Autopsy showed it to be tuberculous meningitis. An increase of the sugar content in the spinal fluid has been observed in paresis, cerebral syphilis, in a majority of the febrile illnesses, in convulsions, brain tumor, meningitis, to which MacPherson's case is a rare exception, for the spinal fluid sugar to be decreased. In the early stage of tuberculous meningitis it may be normal or slightly increased (Greenfield and Carmichael). Unless there is a meningeal hemorrhage, no fibrin web is found in epidemic encephalitis. The spinal fluid may or may not be under pressure. It is of a "water clear" appearance. There is generaly a trace of globulin which bears no relation to plecytosis or the clinical type of the disease (Hunt). There is a moderate lymphocyte increase, always of a pure mononuclear character; usually ten cells per cu.mm..; 30 to 100 cells per cu.mm. are occasionally observed. The increase in cells occurs early in the disease; then gradually returns to the normal. Polymorphonuclear cells escape in hemorrhagic cases into the spinal fluid along with the blood corpuscles. Ayer says there is a slight increase in the protein content; other writers assert that it remains within the normal limit. The gold-sol reaction has a diagnostic significance; it is seen mostly in the leutic zone; occasionally the paretic curve is observed. In post-encephalitic cases, abnormal gold curves are less frequent and of a weaker type. The chlorides are not altered—a valuable diagnostic point in eliminating a meningitis. Greenfield and Carmichael state "that the Wassermann reaction is never positive in the spinal fluid, even in cases which give a positive reaction in the blood. This may be taken as the chief determining factor in the differential diagnosis between meningeal syphilis and encephalitis lethargica."

A careful serologic examination by trained laboratory workers of the cell count, the type of cell, the globulin, the pressure, the color, the protein, the chlorides, the sugar content and the gold-sol reaction, will in a large majority of cases show marked abnormalities in the spinal fluid in epidemic encephalitis.

THERAPY

The therapy of epidemic encephalitis will continue to be empirical and unsatisfactory until an antitoxic serum or vaccine is produced from the specific organism itself. Spinal drainage in the acute attack is a therapeutic procedure of unquestioned value; it is especially indicated in the hemorrhagic form. The intravenous use of Argotrophine is advised by Marburg and Wimmer. To an initial dose of one ampule (15 grains) of sodium salicylate given intravenously, should be added one ampule daily until the point of therapeutic saturation is attained. Sodium salicylate, the intravenous injection of the patient's spinal fluid, the intraspinous injection of the blood serum, activated or unactivated, intramuscular injection of sterilized milk, "fixation abscess" and many other forms of treatment have been used in this infection, all of which emphasize our therapeutic helplessness in this dread disease. Visher has successfully treated with intravenous injections of gentian violet, three cases of encephalitis following typhoid fever and one case of chorea associated with endocarditis. Gentian violet is non-toxic and should be given a trial in epidemic encephalitis.

During the past year, of fourteen acute cases treated with acriflavine by Dr. Hengstler and myself,* three died, eleven were improved and of these five completely recovered. Improvement is usually observed after the second or third injec-

*Since this paper was written, two physicians have reported to me four acute cases of epidemic encephalitis to which they gave acriflavine intravenously, following my suggestion (Minnesota Medicine, December, 1925). All made excellent recoveries.

tion. After apparent recovery in one case, there was a return of the symptoms, which disappeared during the second course of acriflavine injections Dr. Birnberg reports the recovery of a child from encephalitis, to whom at my suggestion he gave acriflavine intravenously. In a case referred by Dr. Hensel, the improvement after acriflavine intravenously was satisfactory; all symptoms of encephalitis disappeared; there developed, unfortunately, an obscure abdominal condition which caused death. In another extremely critical case, definite improvement began after the second course of intravenous acriflavine injections; the patient recovered.

Acriflavine has great potentialities; it can be used in every case where an antiseptic is indicated. It possesses definite bactericidal properties and it is non-toxic in its effect on the tissues. Johnson advises its hypodermic use in advanced cases of pulmonary tuberculosis and states that the results obtained exceeded his expectations.†

A purified form of neutral acriflavine is especially prepared for intravenous use; it comes in ampules. It should be administered immediately after the preparation of the solution. Great care should be taken during the injection to prevent any escape of the fluid into the perivascular tissues, such mischance causing redness and great pain over a region greatly exceeding the affected area. The dose is 10 c.c. of a 0.5 per cent solution. The injection should be given slowly at the rate of 10 c.c. in five minutes in order to avoid distressing symptoms such as a gasping respiration with air hunger, associated with a sensation of heat, affecting the mucous membrane of the respiratory tract, added to which may be an intense lacrymation. The patient should be told of the yellowish coloration of the urine, mucus and other secretions, to avoid needless anxiety. Observation teaches that if acriflavine escapes in the perivascular tissues the vein is obliterated. On different occasions because of this I have been unable to repeat the usual number of injections—eight—when the second series was indicated. King has noted that frequent venous punctures cause thrombosis and render the vein useless.

Any attempt to explain the *modus operandi* of the various forms of therapeutic procedure in the Parkinson syndrome is uterly futile with our present knowledge. There is, without doubt, in the Parkinsonian, a marked psychic factor which is influenced to a greater or less degree by the diverse forms of therapeutic approach. The "tied up by the muscles" feeling, due to the structural changes in the pallidum and the substantia nigra causes a "sense of constant oppression" which paralyzes all initiative and spontaneity of action—most disastrous psychically to the patient. Once relieve this and a feeling of well being and hopefulness is experienced, which, says Hall, "extends its beneficent influence on every part." All forms of treatment probably relax the hypertonia if the reports of improvement following the use of these different methods are to be accepted. Moll has used nicotine in thirteen cases of the post-encephalitic syndrome; nine showed improvement; four were not benefited. The initial injection is 1/30 of a grain, three times a day; if there is no appreciable change in the pulse it can be gradually increased provided there be no symptoms of intolerance until 1/10 or 1/5 of a grain is given. Nicotine does not influence the tremor of sialorrhea, but it does lessen the hypertonia. Six months after its discontinuance, all of the nine patients had relapsed into their former condition. Twenty-five years ago, Erb called attention to the relief experienced in paralysis agitans by the use of hyoscine hydrobromide. Since 1917 it has been much used in the so-called post-encephalitic Parkinson syndrome. In eighteen cases in which it was used by Hohman, there was slight improvement in six; in five it was definite and in seven marked. Some of these patients, after months of invalidism, were able "to attend to personal wants after being bed-ridden and helpless." In half of the cases in which scopolamin was used by Kennedy, Davis and Hyslop, they observed that there was a lessening of the rigidity, a restoration of the facial mobility and that the patients were generally more comfortable. Gelsemium, they found, had an effect similar to that of scopolamin and in the same proportion of cases. The former, they believe, is to be preferred over the latter because "it can be used for an indefinite time and has none of the dangerous concomitant effects of the latter." The disappointment of some of us in the use of hyoscine was in a measure due to the small dosage, caused by our reluctance to prescribe so potent a drug when the patient was not under our immediate observation.

†Johnson, G. H.: Injections of acriflavine for tuberculosis. Brit. Med. Jour., Mar. 27, 1926.

Hall believes that belladonna, by acting on some part of the neuromuscular area, relieves the hypertonia, knocking off, as it were, the shackles from the muscles. The higher nervous centers, being thus unfettered, will do the rest. Belladonna and hyoscine—the atropine group—are therapeutic agents of unquestioned worth, the former being the more efficient. He (Hall) first used belladonna for the relief of the sialorrhea with disappointing results until the dosage was increased from ten to thirty minims thrice daily. Under this treatment the general condidion of the patient so greatly improved that he then tried it in the Parkinson syndrome. Out of nineteen cases, says Hall, six received no benefit. Three reported they were better but there was no objective evidence of this. In ten there was no question regarding the improvement; in some it was astonishing; a surprising change for the better may be observed a few days after the medicine is taken. Foster Kennedy reports a striking therapeutic result in a middle-aged Parkinsonian who could neither articulate, chew, nor move her arms or legs voluntarily, yet after the use of a suppository of belladonna "of tolerance dosage" she could talk flluently, move quickly and gracefully and express her emotions in a normal manner. While the respite was but temporary, yet the same response was invariably obtained.

As to the permanency of this change induced by the atropine group, only time can determine. Several years ago, I called attention to the intravenous use of sodium iodide in the treatment of the Parkinson syndrome. Further observation has confirmed the opinion I then expressed. Castro and Folsom* both advise the intravenous use of sodium iodide in the post-encephalitic psychoses. It stabilizes the emotions, relieves the apathy, depression and irritability and it tends to make the patient pleasant, sociable and agreeable. Folsom says this treatment is only in the tentative stage and that it would seem "that cases do better under such therapy than without it." Fifty c.c. of a ten per cent sodium iodide solution in sterilized water, sterilizing the solution before each injection, should be given intravenously twice a week, until a total of 90 gms. of sodium iodide has been administered. Escape of the solution into the surrounding tissues causes a slight burning sensation which disappears in a few moments. The only symptoms of which patients complain is a peculiar saline taste, which may last from twelve to twenty-four hours. Belladonna can have no influence on the actual lesion but if used in connection with the sodium iodide its synergistic effect would, I believe, be very beneficial.

PSYCHIC MANIFESTATIONS

The psychic factor in the Parkinson syndrome must not be overlooked. One should ever keep in mind Hutchinson's "chronic abdominal woman" who recovered completely for several weeks after each successive laparotomy (Hall). The elimination of this element and the employment of one or more of the various methods of therapeutic endeavor will tend to greatly ameliorate the hapless condition of these unfortunate patients.

During the past nine years the medical mind has been so absorbed with the etiology, the symtomatology, the pathology and therapy of epidemic encephalitis, the most serious, perhaps, of the four† great infections of the central nervous system, that it has failed to appreciate sufficiently that mental disease, behavior disorders and delinquency may follow in its wake. These disastrous after-effects may occur months or, in rare instances, as long as five years after the initial illness.

"Encephalitis" says Economo, "has given us an entirely unexpected insight into psychological and physiological mysteries of mental mechanism—a knowledge which will perhaps exercise a great influence upon *others beside the medical* profession." In England the curve of cerebrospinal meningitis has noticeably declined since 1917; that of poliomyelitis has likewise fallen, while epidemic encephalitis since January 1, 1919, has shown a rapidly ascending increase except that during 1925 there has been a gradual fall (Auden). During the last year we have seen more cases of epidemic encephalitis than at any time during the past nine years. Marie, in his introduction to Gabrielle Levy's work on encephalitis, spoke of the virus which, exploding like a shrapnel shell, affected all parts of the nervous system. To children and adolescents epidemic encephalitis has been unspeakably cruel;

*Castro, Herman R.: Sodium Iodide Therapy in post-encephalitic psychosis. The State Hospital Quarterly, February, 1926.

†Poliomyelitis, polioencephalitis, cerebrospinal meningitis and epidemic encephalitis.

to the adult a Damoclean sword. The minority of these patients die; the physical and mental derelicts, the moral and sexual perverts, the pathologic criminal and the socially inadequate constitute perhaps 70 per cent of the survivors (White and Williams). Apparently, according to Freeman, only one patient out of six ever recovers completely. The sequelæ of encephalitis are more tragic than those of all other infections of the nervous system combined. The late Sir Frederick Mott, in his Chadwick lecture, cites the recent epidemics of encephalitis in which the moral sense of children and young adolescents is affected. What can be done to stem this annual encephalitic contribution to the psychotic and the unfit? Under proper medical, educational and environmental care many of these unfortunates will reacquire the self-control, moral balance and social outlook essential to ordinary life without the stigma of magisterial action (Auden). Under institutional oversight they can be classified, treated and provided with suitable outlets for occupational training and needful recreation. The hospital should be especially adapted to their needs. "Some of these cases," says Wimmer, "may be too sane for an insane hospital but not sane enough for home care; in ordinary hospitals they have no place." Punitive measures in these patients have no deterrent effect; they serve only to increase their antisocial tendencies.

There should be an Encephalitic Guidance Clinic, with a personnel of a neuropsychiatrist, a psychologist and social workers, whose activities would include the entire state. The specially adapted hospital with its facilities for research and the clinic should be situated in a medical center. The intensive study of personality undergoing a gradual disintegration would throw much light on the sequelæ of encephalitis. Many of the disorders of personality in this disease are clearly related to demonstrable biological changes in the nervous system. The importance of this work is apparent. Chicago is devoting $275,000 to only one line of procedure—the scientific study of behavior. Drs. Bond and Partridge, at the Pennsylvania Hospital, Department for Mental and Nervous Disease, and Dr. Raynor at the King's Park State Hospital, New York, are the only ones, I believe, in this country, who are conducting notable experiments in the study of the encephalitic child. The former (Drs. Bond and Partridge) began in 1924 their investigations with a class of ten boys between the ages of eight and twelve years. These boys were intelligent and badly behaved but were free from any evidence of a gross brain lesion except strabismus. After a trial of eighteen months they report that the boys have been a manageable unit, that they made fair progress in education and that their behavior was improved. The latter, Dr. Raynor, unfortunately did not have so favorable a group for experimentation. They were of both sexes and their ages ranged up to seventeen years. Among them were Parkinsonians, non-encephalitic cases and some with a low intelligence quotient. Medical science never stands still. The spirit of smug complacence and resignation with which we have viewed mental defect no longer obtains. The percentage of hereditary feeble-mindedness is relatively small. The majority of mental defectives and the socially inadequate arise from natal and post-natal conditions. Notable among the causes is epidemic encephalitis. The mental deficiency in these acquired and accidental cases is as actual as in germ plasm defect. The significant fact is that thus far no conclusive evidence has been produced to show that these injuries can be transmitted to the germ plasm. With the removal of the hereditary menace and the recognition that the behavior disorders and the moral and mental abnormalities are phenomena radically separate and distinct from the manifestations of feeble-mindedness, our purpose, that of human salvage, is clearly apparent —a matter of tremendous importance from an economic and sociologic standpoint.

For the post-encephalitic psychoses, the various grave sequelæ, the moral obliquities, delinquency and anti-social tendencies, treatment in the home is ineffective and undesirable. Institutional care is imperative and is one of the most urgent needs of the day. The rehabilitation of these human deficients so they can earn a living, be useful to society and obtain for themselves some comfort out of life is the problem difficult. In his book "My Life and My Work," Henry Ford says that he has been able to adapt 9,163 men below average validity, to work chosen for them in conformity with the degree of their weakness—a remarkable achievement. It is this utilization of human inefficiency for which Medicine and society must work and

plan. For the salvage of the encephalitic, for the utilization of his physical, moral and mental impotency, I work and plead!

DISCUSSION

DR. W. A. JONES (Minneapolis): The essayist has covered the field of encephalitis very thoroughly, not only quoted from the literature but from his own experience as well. Perhaps we are going too far in our enthusiasm about detecting a case of encephalitis when it is quite possible it is not encephalitis at all. I recently heard of a case diagnosed as influenzal diarrhea which turned out to be simply an ordinary case of typhoid fever. And we may be led in the same error unless we use better powers of analysis and classify our cases in better order and see that we have a history of the individual very carefully and thoroughly worked out.

At the meeting in Cincinnati the latter part of October, the Central Neuropsychiatric Association had the pleasure of hearing Dr. August Wimmer of Copenhagen. He is an authority on epidemic encephalitis and has written probably one of the most painstaking books on that subject. What interested me most was that he cited forty cases of epilepsy that he thought developed from an encephalitic condition. I presume that is quite probable, but if we are going to describe all of these so-called inherited or chronic nervous diseases as the outcome of influenza or encephalitis, we are certainly getting into deep waters. Most of these people who develop a chronic or habit disease like epilepsy, or other disorders of this type, have behind them hereditary or inherent defective conditions, which are really part of the disease, which almost any factor might bring out and that might easily be called something else.

Hence, it is very necessary that we take more careful histories of our patients. And yet it is admitted that it is very easy for the neurologist as well as the general practitioner to accept hastily the causes and effects and results of disease because he has not taken sufficient time to probe into the type of individual with whom he is dealing, or to get a clear outline of what has gone on before.

I would take issue with Dr. Riggs that backward children and the so-called defective classes are due in any way to influenzal or encephalitic states. Certainly not unless the background was carefully brought out and if nothing existed there, and there was no evidence of effect or inheritance, it seems improbable that influenza could be ascribed to precipitate the cause of this condition except in very exceptional and ill-grounded cases. Neurologists and others are very apt to think that this epidemic encephalitis is a very convenient diagnostic opportunity. But we should be extremely cautious at arriving at a definite conclusion for we know and are told, as Dr. Riggs told us, of the very peculiar and freakish things that follow epidemic encephalitis. They are peculiar and very interesting, but they can be found in patients suffering from other acute illnesses not encephalitic in origin.

NOTES ON SURGERY OF THE SPLEEN*

IVAR SIVERTSEN, M.D.
Minneapolis

It is not essential that the histology or embryology of the spleen be reviewed in detail. The spleen is the first of the hemolymph glands to appear, as a condensation of the mesenchyme in the dorsal mesentery of the stomach. It is bean-shaped, about five inches long, weighs about five or six ounces, lies in the left hypogastric region, directly beneath the diaphragm, and moves with respiration. It is a dark, purplish colored organ, presenting a smooth convex surface covered with peritoneum that is reflected at the hilum to the stomach and diaphragm, and serves to support and hold the organ in place.

The relations of spleen to stomach, pancreas and diaphragm are important in splenectomy. In the gastro-splenic peritoneal folds are found the vasa brevia, branches of the splenic arteries. The tail of the pancreas is frequently attached to the pedicle of the spleen. The diaphragm may be adherent and, if adherent, careful separation is imperative.

The pedicle carries the blood supply. The splenic artery arises from the celiac axis, gives a branch to the pancreas, a branch, the left gastro-epiploica, the vasa brevia and several other branches before entering the spleen. The veins are similarly arranged though they run a more direct course in the pedicle. The splenic vein empties directly into the portal vein. The spleen consists of, in the main, a reticular structure of endothelial material with cells so loosely arranged that the blood slowly filters through it. The arteries end near the periphery by branching. At each branch is a follicle of lymphoid tissue, the Malphigian corpuscle, an important factory for lymphocytes. Pulp cells (phagocytic, pigmented, and eosinophilic) fill the remainder of the organ. Ferments and hormones are manufactured in the spleen, and the blood pigment metabolism is influenced by the pulp cells. The spleen is looked upon as a member of the sympathetic endocrine system.

The spleen is not essential to life. This fact was recognized by the ancients. Aristotle recorded instances of a congenital absence. Pliny

*Read before the annual meeting of the Northern Minnesota Medical Association, Crookston, Aug. 9 and 10, 1926.

stated that a splenectomy was performed in his day in man and in animals. A sect of surgeons about 1700 A. D. achieved considerable notoriety by the performance of splenectomy.

INDICATIONS FOR SPLENECTOMY

Following a bitter controversy between Simon and Huchler of Darmstadt in 1855, the Surgical Society of Hesse concluded that the only indication for splenectomy was an injury to the spleen that would (but for splenectomy) prove fatal.

Collier, in 1882, compiled a study of the operated cases up to that time and concluded the operation was also justified in cases of splenoptosis, cysts, and in idiopathic enlargements of the spleen.

Moynihan, Mayo, and others have done much to clarify the situation. They have concluded that splenectomy is indicated as well in early selected cases of pernicious anemia, splenic anemia, hemolytic jaundice, and in selected cases of Gaucher's disease. Splenectomy has been found beneficial in certain cases of malaria and tuberculosis.

Kaznelson in 1916 first advised splenectomy for thrombocytopenic (formerly called idiopathic) purpura hemorrhagica, which is sound advice only in the chronic cases.

Besides these conditions there are those such as embolism and thrombosis of the splenic and portal system that require mention. These are found more frequently at operation than are diagnosed before operation.

CONTRAINDICATIONS

Even though the spleen may be dispensed with, it was found that splenectomy was not the panacea for all cases with enlarged spleen. The failure in all forms of leukemia was recognized early. Polycythemia, Still's disease (of children), cirrhosis of the liver, and late cases of pernicious anemia do not respond to splenectomy. Certain cases of syphilis and malaria are better treated medically. Splenectomy has no place in kala azar, pseudoleukemia infantum, rickets, or Hodgkin's disease. Splenectomy had better be deferred in the acute cases of thrombocytopenic purpura hemorrhagica. These lessons have come from sad experiences. Splenectomy has been tried without success.

The following conditions may simulate at first an enlarged spleen, and have appeared under postoperative diagnosis: kidney or perinephritic tumor, suprarenal tumor, carcinoma of splenic flexure, pancreatic tumor (as cyst or carcinoma), gastric malignancy, ovarian tumor, tuberculous peritonitis, and, the most meek and lowly of all, fecal impaction.

DIAGNOSIS

The following notes as to diagnosis may be of value in recognizing a condition in which splenectomy is indicated. Wherever this procedure is indicated it is often a wonder-working accomplishment. When performed where not indicated it will often unduly hasten a fatal termination of the disease.

In injury there will always be either a wound, or history of an injury, with evidence of hemorrhage, external or internal, and with the signs of shock, pain, tenderness, and rigidity over the affected area. Immediate operation is indicated.

Splenoptosis is found often in multiparous women, is recognized as a movable, wandering tumor with a notch. The symptoms may closely simulate those of an ovarian cyst, especially those with twisted pedicle. Splenoptosis with twisted pedicle may lead to a surgical emergency and must so be treated.

The various infections, such as echinococcus, tuberculosis, syphilis, abscess, malaria, and the like, must be diagnosed from the history, physical findings of each particular disease, with pain, tenderness and tumor that point to a localization in the spleen.

Tumors are usually diagnosed after exploration, and exploration is always justified in case of tumor of the spleen that cannot be definitely assigned to other etiology.

The picture of pernicious anemia is too well known for much elaboration, but a careful blood study must be undertaken to make the diagnosis. Splenectomy in early cases with repeated transfusions and other medical treatment to follow the operation promises to lengthen the expected span of life, in an otherwise almost hopeless condition.

Splenic anemia (Banti's disease) is characterized by a chronic progressive course, without remissions, a slowly progressive splenomegaly, that includes fibrosis of the reticulum, thickening of the capsule, and enlargement of the vessels. The anemia is secondary in type, with leukopenia. There are hemorrhages of various kinds. The liver becomes involved late in the disease. There is slight icterus, if any, and the lymphatics are not involved.

Hemolytic or acholuric jaundice is due to dysfunction of the reticulo-endothelial system of the spleen; hence splenectomy cures the condition. In the familial type the jaundice is chronic, slight, acholuric, dating back to infancy in many cases. The gallbladder participates in 60 per cent. The spleen is enlarged without being tender. Anemia is secondary. The characteristic change in red cells is increased fragility. In the acquired type the picture is different, acute, deep jaundice, severe anemia, with pain and fever.

Thrombosis of the splenic vein is associated with splenomegaly and hematemesis.

Gaucher's disease is a chronic affection of childhood, with slight anemia, rarely icterus, markedly enlarged spleen and slightly enlarged liver. The red cells are normal. The major part of the lesion is in the spleen, but splenectomy does not remove all of the lesion.

Thrombocytopenic purpura hemorrhagica, is not inherited, is seen in women frequently, is characterized by repeated petechial hemorrhages without trauma, prolonged bleeding time, normal clotting time, non-retraction of the blood clot, and low platelet count, and deformed platelets. The acute stage of this disease does not respond to splenectomy, and this must be recognized. There is without warning a severe uncontrollable oozing from the mucosa into the tissues with hematemesis, hematuria and bloody stools. Remember here that repeated transfusions will control this acute stage; splenectomy will cure when the acute condition subsides.

DIFFERENTIAL DIAGNOSIS

Pernicious anemia may be confused with the hemolytic anemia of pregnancy, the parasitic hemolytic anemias, gastric carcinoma, chronic poisoning by carbon monoxide, lead or arsenic and hemolytic jaundice.

Splenic anemia may be confused with the manifestations of gastric or duodenal ulcer, cirrhosis of the liver, syphilis of the liver or spleen, and chronic obstruction of the splenic vein.

Hemolytic icterus is at times closely simulated by pernicious anemia.

In thrombocytopenic purpura hemorrhagica one must differentiate between the acute and chronic stages. One should also think of and carefully differentiate this condition from acute aplastic anemia, aleukemia, leukemia, bone marmor tumor, pernicious anemia and hemophilia because of the poor results that will follow the splenectomy in these later conditions as compared with the beautiful results following splenectomy in thrombocytopenic purpura.

SPLENECTOMY

We prefer to stand on the patient's right side, because from this side we obtain a better view of the pedicle, the ligation of which is the most important step in the operation.

Step 1.—With very few exceptions our incision is the so-called transverse, cutting across the abdominal wall below the costal arch, beginning to the right of the median line (linea alba) cutting through the skin, superficial fat and fascia down to the fascia of left rectus muscle, cutting this muscle transversely, down through the transversalis fascia and muscle. The peritoneum is freely incised in a similar direction.

Step 2.—Through the above incision the isolation of the spleen is usually simple, though at times it may be rather troublesome. The wound retracts easily, and with the right hand one will be able to palpate the spleen and in fact may be able to visualize splenic adhesions with the aid of a well placed retractor and a good reflected light. It may be impossible to liberate the spleen when it is fused to the surrounding structures, and consequently further procedure will be contraindicated. When adhesions even though firm and intimate can be separated, the operation may be continued, taking care that no injury be done the spleen even at the expense of slight abuse or trauma to the abdominal wall or diaphragm. All adhesions which may contain blood vessels must be doubly clamped or ligated before division. When the spleno-phrenic ligament is vascular it must be separated into several bands or sections, doubly ligated and divided. If the spleen is grasped with a piece of gauze over the glove one will be able to draw the spleen down so as to note the position of the adhesions. It is advisable to liberate the phreno-splenic ligament first and then attack the adhesions which may be holding the spleen in its bed. Adhesions to the colon, stomach and to the tail of pancreas must be looked for and treated as may be indicated.

Step 3.—After all adhesions both normal and abnormal have been separated the organ is delivered from the abdominal cavity and turned toward the left side of body so as to better expose the internal or under surface of its pedicle. By careful manipulation and separation, the vari-

ous vessels in the pedicle are doubly ligated and divided beginning caudally and working upwards. This separation of each vessel in turn is a very delicate procedure and each ligature must be placed with care, so as not to tear the vessel and yet ligate tight enough to prevent hemorrhage. Care must also be used by the assistant in supporting the spleen and in preventing its sudden displacement. As few instruments as possible should be used in separating the vessels, preferably using the fingers and blunt ligature carriers rather than needles. Remember especially that the splenic artery and vein may be difficult to find because of the tail of the pancreas to which they are often adherent. If such should be the case throw a ligature around the whole mass and then ligate each vessel separately after section.

Step 4.—Now examine the whole operative field, pick up any bleeding point wherever possible with forceps—otherwise use a small needle and catgut. Look especially for bleeding on the diaphragm by retracting the stomach and intestines.

Step 5.—We always leave a small cigarette drain in the cavity of the spleen on closing the abdominal wall. We suture the peritoneum and fascia with a No. 2 catgut. The muscle we do not suture except with two stay sutures which we pass through the body of the muscle above and below our line of incision. No. 1 catgut is used for the skin. The contraindications for splenectomy from a surgical standpoint must be considered and the foremost in this classification is probably adhesions which cannot be separated without undue risk to the patient.

POSTOPERATIVE SEQUELA

There are certain clinical events that one may expect to encounter after splenectomy. They include a two or three day illness that may cause some alarm. The fever may rise to 103 though most often it is around 101. There is considerable loss of weight during this spell. The pain in the long bones of the legs may be rather pronounced. There is usually a decided fall in the red cell count for a few days with leucocytosis and temporary superficial adenopathy is often noted. These symptoms and signs should subside within three or four days and from that time an uneventful convalescence ensues.

CASE REPORT

Miss A. N., a student, aged 16, and a native of Minnesota, was seen March 4, 1926.

Family History.—Normal birth and a normal childhood. Mild influenza in 1918; no accidents; no untoward habits.

Present Illness.—Epistaxsis, excessive, frequent, spontaneous, of three days duration, every seven to eighteen days for the past four months. Slight indigestion; no hematuria; premenstrual backache. Glasses cured headaches five months ago. Packing nose has been necessary to control epistaxsis. Areas of redness have appeared and disappeared on the skin; loss of strength and weight noted lately. Menses have been regular and normal except that she has been flowing for the past two weeks steadily.

Physical Examination.—White girl, pale, anemic, apathetic; skin shows many areas of petechial hemorrhages; blood pressure not taken for this reason; temperature and pulse normal; thyroid slightly enlarged; heart and lungs normal; abdomen negative; some pyorrhea; hemorrhages about joints; is menstruating.

Laboratory Findings.—No urinalysis made (menses). Blood: Hb. 60 per cent.; r.b.c. 3,400,000; platelets 45,000; w.b.c 10,950; s.l. 13 per cent, l.l. 19 per cent; e. 4 per cent, p.m.n. 56 per cent, l.m. 8 per cent, a few immature lymphocytes present, slight poikilocytosis, few normoblasts and some polychromatophilia. Coag. 5.5 minutes, bleeding time 6.5 minutes, Group II.

Diagnosis.—Thrombocytopenic purpura hemorrhagica; possibly aleukemia.

Treatment.—Mar. 6, 1926: Blood transfusion of 490 c.c. in vein; 20 c.c. intramuscularly; calcium chloride, coagulen. Blood: Hb. 48 per cent; r.b.c. 2,520,000; platelets 71,000; hemorrhages stopped.

Operation.—Mar. 9, 1926: Platelets 45,000; bleeding time 2 min; clotting time 2.5 min. Splenectomy, spleen adherent to colon and diaphragm; oozing ceased upon removal of spleen prior to suturing abdomen. Weight of spleen 250 grams.

Postoperative.—Uneventful convalescence except for fever and leukocytosis. Platelets 400,000 on Mar. 12, 1926. Home Mar. 27, 1926.

Follow-up.—April 19, 1926: Gaining weight and strength, color improving, feeling very well.

The pathologist's report from the University laboratories contains the following notations: "The spleen weighed 250 grams, against a normal weight for the age of about 125 grams. The microscopic picture is quite variable. The follicles are definitely enlarged and the pulp is of quite a lymphatic structure although there are areas which seem to be definitely myeloid, perhaps representing myeloid metaplasia. These areas consist of myelocytes, both eosinophilic and neutrophilic and of polymorphic forms of the same variety. This in itself is suggestive of leukemia. Another suggestive fact is that many sinuses are filled with white blood cells, some of which are leukocytes, some lymphocytes, and there are others which are apparently free reticuloendothelial. * * * In the blood smears are found occasional myelocytes. These might be present in leukemia but they might also represent simple bone marrow stimulation, especially in a young individual. The few platelets seen were very large. This undoubtedly represents stimulation of the megakaryocytes."

DISCUSSION

DR. BENJAMIN F. DAVIS (Duluth): In my discussion of this excellent paper, I shall confine myself to what is practically a new indication for operation on the spleen, namely, aneurysm of the splenic artery or its branches. This was emphasized by Baumgartner and Thomas,* who found that, of forty cases of aneurysm of the splenic artery reported between the years 1847 and 1923, six had been operated on with four recoveries. Thirty-three of the cases were diagnosed at necropsy. In most of these, death was directly due to the aneurysm. Many had had symptoms of abdominal pain or distress, enlarged spleen, and gastro-intestinal hemorrhage; a few had epigastric tumor with murmur. In most of them, the diagnosis was indefinite. With the symptoms of abdominal pain, gastro-intestinal hemorrhages, splenic and epigastric tumors, and roentgen-ray studies ruling out tumors of the stomach, aneurysm of the splenic artery should be considered and operation advised, for in operation lies the only hope of recovery in these cases.

I present herewith a specimen removed at operation in October, 1924. This case was reported in the A. M. A. Journal, Jan. 17, 1925 (page 200). The patient was a man, aged 67, who had a movable, painless mass in the left side of the abdomen at about the level of the umbilicus, first noticed two days before, and without other signs or symptoms relevant to it. The mass was about 10 cm. in diameter, did not fluctuate, was easily pushed up beneath the rib margin, and promptly came down again when the patient stood up or inspired. Pulsation, thought to be transmitted from the aorta, was present. Under the fluoroscope, the mass was found to lie above the transverse colon and below the stomach. The blood Wassermann reaction was negative. The family history was without bearing on the case. A diagnosis of probable tumor of the mesentery or spleen was made.

Under ether anesthesia, a left rectus incision was made, which disclosed an aneurysm of the splenic artery presenting through the lesser peritoneal cavity, displacing the tail of the pancreas forward and medial. Expansile pulsation became evident after the wall of the aneurysm was exposed. The afferent and efferent portions of the splenic artery were ligated, and the aneurysm was removed intact. The abdomen was closed in layers without drainage. Convalescence was uneventful. Laboratory examination revealed a saccular aneurysm, 10x8x9 cm. size, with extensive mural thrombosis.

In the case here reported, the only sign was that of tumor; expansile pulsation was not recognized as such until the lesion was exposed.

Treatment: Three procedures are suggested: (1) ligation, (2) ligation and excision, (3) splenectomy. The choice of procedure will be governed by the location of the aneurysm, the condition of the patient and the condition of the spleen, especially with regard to adhesions which might make the operation of splenectomy dangerous. Although apparently the spleen may be deprived of its arterial blood supply and left to undergo aseptic necrosis and absorption with safety, probably splenectomy is indicated especially in cases of aneurysm at the hilus or within the substance of the spleen; but even then, while desirable, it is not essential.

*Surg., Gyn. and Obst., 39:462 (Oct.), 1924.

THERAPEUTICS—ANNO DOMINI 1926

A few pseudo-medical journals still eke out a precarious living by selling their advertising pages to nostrum exploiters who cannot obtain space in reputable medical journals. One of these survivals is the *Archives of Therapeutics*, published by the Archives of Therapeutics, Inc., 243 Fourth Ave., New York City, which gives on its title page the names of Carl P. Sherwin, M.D., Sc.D., LL.D., as editor, Benjamin Harrow, Ph.D., as managing editor, and of fifteen associate editors, some of whom are men of unquestioned professional standing. In the November, 1926, issue are thirteen and three-quarters pages of advertisements of nostrums, the great majority of which are not only unacceptable for "New and Non-official Remedies," but have also been at one time or another the subject of critical reports. Some of these are: Abican, Agarol, Anasarcin, Antiphlogistine, Campho-Phenique, Cactina Pillets, Chionia, Echthol, Gray's Glycerin Tonic, Hexalet, Hyperol, Pasadyne, Phillips' Phospho-Muriate of Quinine, Peacock's Bromides, Pineoleum, Prunoids, Sal Hepatica, Sanmetto. In addition to this list there is a full-page advertisement of "Orchaphrin Tablets" and "Ovaphrin Tablets," described as aphrodisiacs for men and women respectively. They are said to be mixtures of yohimbine hydrochloride, extract of nux vomica, sodium nucleinate, pituitary, thyroid and suprarenal substances, and to differ only in that the "Aphrodisiac for Men" contains, in addition to the products listed, orchic substance, while the "Aphrodisiac for Women" has ovarian substance.

This number also contains a "Ready Reference Index" listing 120 pathologic states and giving 300 recommendations of proprietary remedies for their treatment. (Jour. A. M. A., Dec. 11, 1926, p. 2017.)

THYROID IN OBESITY

Reduction of weight should not be undertaken by means of thyroid alone. Dietary procedures form the basis of all scientific and rational reduction methods. In some instances, when diet will not suffice, thyroid may be used. When prescribing the drug, physicians should make certain that they will be supplied with the U. S. P. product and small doses should be given at the beginning, watching the pulse and nervous system. Thyroid is always a double edged sword and must be used with caution. (Jour. A. M. A. Dec. 18, 1926, p. 2114)

CURRICULUM OF A TECHNICAL SCHOOL: MEDICINE*

E. P. Lyon, Ph.D., M.D.

Dean of the Medical School, University of Minnesota
Minneapolis

A technical or professional school differs from an Arts College in the more definite specification of its product. It is like a factory making a special and peculiar product. Everything about such a factory is adapted to the end in view. Nevertheless a considerable variety can exist in the methods employed and in the order of procedures, and a good deal of doubt can prevail among experts as to the materials, relative strength and importance of the elements used and the design of the various parts that will produce the best final product.

Of course the chief product of a medical school is doctors. Everyone admits that, and every honest school wants to turn out good doctors. But there is considerable variety in the specifications which are written by experts as descriptive of a good doctor, and there is variety in the methods advocated for producing a good doctor to fit any given specification. Here are some specifications:

By Doctor Vaughan (I quote from memory): "Medicine is the application of certain parts of biology, chemistry and physics (I add psychology), to the diagnosis, treatment, alleviation and prevention of human disease."

Here is one that I drew up several years ago:

"A good doctor is a keen observer. We must train the powers of observation in our students. We may say that there is a technic of observing and that we must teach this technic.

"A good doctor is a trained experimenter. That is, he combines control of conditions with observation. We must train our students in experimental methods in the laboratory and at the bedside. This is technical training.

"A good doctor is a skilled technician also in another and narrower sense of the word. He knows how to do certain things connected with the practice of his profession, things requiring accuracy of hand, eye and ear. We must train our students in the technic of their profession.

"A good doctor is a man of judgment. He must be able to draw correct conclusions from observations and experiments. He must be able to synthesize isolated elemental facts into a unified compound. We express this idea when we say he must be able to think.

"A large part of our teaching is devoted to giving students what we consider valuable thought-stuff; facts we call it. We also give them numerous examples of thinking—ready-made combinations of facts or so-called conclusions. This is well. . . But when it comes to making new thoughts, the only way is by practice and repetition and habit. We can help another man's thinking chiefly in the same way that we can help his drawing or his chemical analysis or his physical examination, namely, by stimulating his interest, by showing him where he fails and by teaching him to criticize his own work, as he would any other technical achievement.

"Finally, the good doctor is a man of character, which means again, I suspect, only that he has on hand certain kinds of brain-stuff, makes certain kinds of associations of it and reacts in certain ways to these associations. Here, again, example and criticism are the basis of teaching. A good doctor is skilled in the technic of right behavior. He makes mistakes in ethics no more than in counting blood-corpuscles."

More recently I have come to think of the good doctor in another way; he is, let us say, fifty per cent scientist and fifty per cent technician; but he is one hundred per cent something else, for which I can find no better word than "minister." People go to the doctor to have their fears allayed, their hopes stimulated, their confidence in themselves and their universe reestablished. They go for sympathy. Pain is an affair of the mind and they go to have it removed or diminished. The quality that makes the doctor successful in meeting these demands is not measured entirely by his scientific knowledge, technical skill and moral character. Some people might call it salesmanship, but I am not thinking of the financial side. That will take care of itself if the doctor really possesses the power I am trying to describe.

Unfortunately our curricula do not recognize this part of the specification. We leave it out of the contract. We do not know how to take it into account either in selecting or training our students. Perhaps this is the weakest feature of medical education. Perhaps some day the psychologists will tell us how to select men who have this quality. Then our average product will be improved.

*Read before the Seminar on Advanced Education, College of Education, University of Minnesota, April 19, 1926.

The differences of opinion regarding both the specifications and the methods are chiefly as to the importance of so-called practical knowledge versus scientific knowledge, or the relative importance of ability to do and power to understand. In another way the controversy may be expressed as art versus science.

Science is supposed to give the power to understand. Work in hospitals and dispensaries, helping in the care of the sick, repetition of approved technical procedures under a variety of conditions, and consequent development of judgment as to the circumstances under which these procedures should be employed are supposed to develop the ability to do or the art of medicine.

It will be seen that these somewhat antagonistic points of view are typified partially by the laboratory versus the clinic. This was true much more in the past than it is now. They are also exemplified by two entirely different historical backgrounds in medical education.

On the one hand is the evolution of medical education as it took place in the European universities, particularly in Germany. The medieval universities were essentially centers of philosophy and logic. They were interested in expounding authority and not in fostering research into objective phenomena. The doctor's degree was established on a purely scholastic basis. Practice was considered menial. Surgery was done by barbers. The professor would not dissect. Pictures of early dissections show the servant doing the actual work, while the doctor pointed out the structures with a wand and expounded Galen.

This ideal persisted very late. In the armies of Frederick the Great the surgeon ranked just above the drummer, and he shaved the officers. When Helmholtz graduated in 1842 his thesis was on the cutting of tumor, but he had never seen the operation. Logic as a required subject in the German medical curriculum was not discontinued until about 1857.

The hospitals in early times were quite apart from the universities, and they still are in France. In Leyden in 1630 clinical instruction was instituted in the medical faculty, but the students objected and it was given up. It was revived by Boerhaave, who became professor at Leyden in 1709. This time clinical instruction as a University discipline survived in Holland. Van Swieten, a pupil of Boerhaave, was called to Vienna by Maria Theresa in 1745, and with that date the great clinical school of Vienna may be said to have begun. The German laboratories grew up in connection with the university in the nineteenth century. The first in anatomy was Breslau, 1814; in physiology, Breslau, 1824; in physiologic chemistry, Giessen, 1825; in pharmacology, Dorpat, 1849; in pathology, Berlin, 1856. Note that our present ideals of medical education of university type are hardly a century old.

In Germany the great progress of science in the nineteenth century affected and was affected by the laboratories and clinics alike. Both were in and part of the university. Students progressed systematically through the sciences into practical work. The professors of practice came up through the laboratories and were chosen because of scientific distinction.

In France and England the medical schools grew up around the hospitals, and to this day in England a degree is not necessary for practice. The students "walked the hospitals" with the doctors, and got their anatomy, chemistry, etc., on the outside in any way they could. The result was preeminently a practical profession, with but little tendency to advance on the scientific side. Gradually the hospital schools developed departments of anatomy, physiology, etc., but even now these schools are dominated by the clinical side, although something like a curriculum has grown up.

In what is now the United States the first medical school was founded in 1765 at Philadelphia and became the Medical School of the University of Pennsylvania. In New York, medical instruction at King's College, now Columbia, dates from 1768. Harvard Medical School began in 1783 and Yale in 1810.

The distinguishing feature of American Medical Education was the proprietary school, the first of which at Baltimore dates from 1807. Flexner thus describes this type of school:

"A third type, already so discredited as to have become absurd, is associated with the New World, where an unprecedentedly rapid expansion of population over an enormous territory created a demand for doctors long before there existed facilities for their proper training or means for their proper support. The inevitable happened. Loose and shifting bands of practicing physicians, calling themselves a faculty, tried to impart, chiefly by lectures, to heterogeneous, uneducated groups of students the empirical knowledge, sound and unsound, which they themselves possessed. First and last, American towns have produced over four hun-

dred such medical schools. The teaching of medicine on these terms was, directly, in cash, and indirectly, in prestige, a profitable business. In time the medical profession—to its credit be it said—undertook itself to set its own house in order, and with such marked success that schools of this extreme type have within the last decade practically disappeared. But consequences of the educational chaos in which for seventy-five years the country and the medical profession were involved are still in evidence. Pioneer conditions explain how the physicians of that day came to manufacture, by the thousand, doctors who had had small chance to acquire either knowledge or skill. The medical profession now knows better; but large sections of the people have not yet unlearned the bad lesson they were then taught; so that medical sectarians employing a technic compounded of illusive promises, bragging, and advertising, operate profitably on a scale that would have amazed, perhaps even shocked, the regular profession in the heyday of proprietary medical education."

The Schools of Harvard, Columbia, Pennsylvania, etc., at first University schools, became in reality proprietary institutions. They were run by their faculties and almost wholly on the fees of the students. The proprietary school was founded by and revolved about a dominant personality, usually a surgeon. Here at Minnesota his name was Millard, a man above the average of this type. In a given city the founding of a school by one group of doctors was the sure stimulus to the founding of another by a competing and rival group. Thus as many as thirty-nine schools were founded in Chicago, twenty-one in St. Louis, and four or five here in the Twin Cities.

In Missouri, at the time I was in St. Louis University, and perhaps even now, all that was necessary to obtain a charter and the right to give degrees was a petition by five men to the State Supreme Court. They did not need to demonstrate any ability, financial nor intellectual; and no legal supervision or restriction of their activities was provided. The culmination of this was the recent scandal over the traffic in diplomas by the College of Physicians and Surgeons, St. Louis—a scandal which resulted in the revocation of about 150 licenses in Connecticut.

In the American proprietary school at first there was no curriculum. There were no preliminary requirements, except that the candidates were supposed to have studied with a preceptor. A two year course of lectures was required for the medical degree, but the senior course was a repetition of the junior course. The seniors had a right to the front seats in the amphitheater. That was the only difference between the two years. Limited and precarious dissection was about the only laboratory study.

The first three year course was organized at Northwestern in 1859 and this advance gradually became universal, at Harvard, for example, in the early seventies. Later the four year course became universal, chiefly through state license requirements. This course was graded, the laboratory subjects filling the first part.

There were many efforts toward improvement. There was improvement in individual schools. But the system itself survived at its worst until 1910. No real standard of preliminary education was required in many schools. They had no adequate laboratories or clinics. Students were obtained by flamboyant advertising. The terms of attendance were short. There were no standards of any kind. Diplomas could be purchased without any study requirement, if one knew where to go and had the money. I knew of instances where freshmen flunked out at St. Louis University the first semester and received their degrees at another college the same spring. This took place as late as 1906. About 1902, while at Rush, I was sent to Indianapolis to investigate an eclectic medical college. I found it quartered in two small rooms over a feed store. The only furniture consisted of a blackboard, a few chairs, and two tables, on one of which a cadaver may sometime have rested. This was an extreme case, but even Harvard did not have microscopes for student use until 1870.

The astonishing change in American Medical Education which has taken place in fifteen years was not the result of any one cause, unless that cause may be said to have been the unsatisfactory condition which existed. On the whole the reform may be said to have been originated and carried out by the medical profession itself, but chiefly by a few leaders and the medical educators. High lights in the movement were: (1) the founding of the Johns Hopkins Medical School in 1893; (2) the work of the Association of American Medical Colleges; (3) the requirements of the State Examining Boards, although these tended to follow rather than precede progress in the schools themselves; (4) the Council of Medical Education of the American Medical Association dating, I think, from 1904; and (5) the Report of the Carnegie Foundation in 1910—the so-called Flexner report. This last

A

FRENCH CURRICULUM (Suggested)*

Mornings	*Afternoons*
1st year	
Clinics in medicine and surgery	Winter—Anatomy Summer—Histology and physiology
2nd year	
Clinics in medicine and surgery	Winter—Anatomy Summer—Histology, physiology, chemistry
3rd year	
Clinics in medicine, surgery and obstetrics	Winter—Bacteriology, pathology Summer—Operative surgery, parasitology, pathology
4th year	
Clinics in specialties	Winter—Pathology Summer—Materia medica and pharmacology
5th year	
Clinics in pediatrics, infectious diseases, etc.	Winter—Neurology, hygiene Summer—Psychiatry, legal medicine

GERMANY: Suggested order of studies in one University.

1st semester:	Osteology, zoology, physics, chemistry.
2nd semester:	Anatomy, physics, chemistry, botany.
3rd semester:	Anatomy, histology, physiology, chemistry.
4th semester:	Anatomy, physiology, physiological chemistry. Examination in basic and preclinical sciences.
5th semester:	Anatomy, physiology, physical chemistry.
6th semester:	Pathology—general, special, and experimental; auscultation and percussion; pharmacology; propaedeutic medical clinic and general surgical clinic.
7th semester:	Pathology, auscultation and percussion, clinical microscopy; medical, surgical and obstetrical clinics and lectures.
8th semester:	Pathological anatomy and histology; medical, surgical, obstetrical clinics; lectures in psychiatry.
9th semester:	Medical, surgical, obstetrical, psychiatric, pediatric, and special clinics, hygiene, serology.
10th semester:	Special clinics; hygiene; legal medicine. Final examinations followed by practical year.

ENGLAND: Old Curriculum.

1st year:	Chemistry, physics, zoology.
2nd year:	Anatomy, physiology
3rd year:	Winter—Anatomy, physiology, materia medica. Summer—Pathology, medicine, surgery.
4th and 5th years:	Clinical subjects in different orders.

"The curriculum in Great Britain is, however, now planned on the basis of six years' study of which two and a half are to be devoted to the medical sciences and three and a half to the clinical subjects."

B

UNITED STATES: Two premedical years including biology, chemistry and physics.

1st year:	Anatomy, physiology, physiological chemistry.
2nd year:	Physiology, bacteriology, pathology, pharmacology, physical diagnosis.
3rd year:	Obstetrics, medicine, surgery, clinical microscopy, pathology.
4th year:	Medicine and surgery, including clerkships, specialties, etc.

*These curricula are quoted from Flexner, Medical Education, 1924.

was supported and carried on by an outside agency, but it was the American Medical Association Council which influenced the Foundation to undertake the task. So I think I am correct in saying that the ills of medical education were healed from within.

The movement of reform has gone forward with extreme rapidity. In place of 180 medical colleges existing in 1910 we have less than ninety. Almost all are *bona fide* parts of universities. Almost all are honest institutions. All require two years of college work, with considerable preparation in science, preliminary to enrollment. Nearly all have reasonably good laboratories and some clinical facilities. The best are as good as any in the world. The change is astounding.

I have introduced the historical matter on account of the effect of history on the curriculum, from which topic I have perhaps been diverted too widely.

Another fact which influences the medical curriculum may be thus stated, quoting Dr. Welch:

"It is impossible to impart the entire contents of medical and surgical science to the student. You cannot even impart the contents of any single subject in the curriculum. The most you can expect is to give to the student a fair knowledge of the principles of the fundamental subjects in medicine, and the power to use the instruments and the methods of his profession; the right attitude toward his patients and toward his fellow-members in the profession; above all, to

put him in the position to carry on his education, because his education is only begun in the medical school, and therefore our aim should be to enable him to complete his education, which goes through all the remainder of his life."

I may add that where there is so much to teach and so little time, much difference of opinion develops as to the relative value of the various subjects, and every department keeps demanding more hours. Moreover new subjects arise and demand time. Just now Physico-therapy and Medical Economics are such subjects.

I think we have already overloaded the curriculum. We have tried to teach everything. We have not been content with Prof. Welch's advice —"a *fair* knowledge of the *principles* of the *fundamental* subjects." Italics are mine.

We will now take up the actual sequences of studies at present in use and comment on the supposed strength and weakness of each.

The accompanying Chart A gives the approximate curricula of French, English, German and American schools. In the case of the European institutions these are advised or suggested arrangements only. The student can take his work in any order he wishes, subject only to the examination ordinances. In America the curriculum, somewhat varied from the sample, is usually rigid.

The French curriculum is what is called a vertical arrangement. Scientific work and clinics are mixed from the start. This follows from the historical development in France, which I have sketched.

The British, German and American curricula are of the horizontal type, science training (for the most part) in the first two (or three) years and clinical work in the last two or three years. In England this is called the "block" system. In England and Germany there are comprehensive examinations between the two blocks. In America usually the system of course examination prevails,—swallow, regurgitate and take the next meal! I sometimes call it the mile post system, or the hurdle system,—no runner cares for the mile post or the hurdle after it is passed.

The French or vertical system is criticized on the ground that the student is thrown into clinical work without foundation; that he "gets his impressions of health and disease quite higgledy-piggledy"; that the instruction is handicapped by the presence of beginners along with more advanced students, and that the students sacrifice the scientific for the practical side. The preemption of the best part of the day by the hospital work shows the historical development and the traditions attaching thereto.

The horizontal systems are criticized on the ground that the student lacks the interest in the sciences that would be aroused by a certain amount of acquaintance with the practical aspects of medicine; that the normal cannot be understood without the abnormal and indeed presupposes the latter; that the students forget a large part of their scientific training before they put it to use; and that they fail to correlate the two parts of the curriculum, that is, fail to apply their scientific training in their practical work. The last criticism is really a criticism of the clinical instruction and is being corrected as we get into clinical chairs, men really trained in science.

Well, "you pays your money and you takes your choice." I can only say that neither the vertical nor the horizontal system has ever been put to the test of impartial experiment. Medical education is full of problems which would lend themselves to modern methods of educational research.

One matter which has not been tested scientifically is the allotment of time among the various subjects. For some years there was a tendency in America to standardize the allotments. The American Medical Association worked out a recommended standard curriculum to consist of four thousand clock hours divided in approximate percentages among the different departments. The Association of American Medical Colleges has adopted a similar curriculum, with fairly liberal variations permitted in the percentages. While these helped perhaps to raise the standard of some schools and helped others to get rid of the extravagant "rights" in dominant departments, on the other hand these curricula have tended to get into state board requirements and even into the statutes, thus hampering experiment in curriculum making. On the whole the feeling is in favor of much more freedom in the matter of distribution of teaching among departments. The Association of American Medical Colleges has voted to give members freedom to experiment with the curriculum, even if in so doing they deviate from Association rules.

I am a real iconoclast on this topic. No one knows just how much anatomy, how much physiology, how much medicine, how much surgery is

best for the average student. Everyone knows that the amount best for one student might not be the best amount for another student. Everyone recognizes the tendency of every teacher to overemphasize his own branch and teach too much detail. Everyone knows that these divisions of knowledge are arbitrary and overlapping and that what a student fails to get in one place he may pick up in another. I have only one obsession and that is to keep the required or assigned hours of each department as low as possible and permit the student as free an election as a fearless juggling of rules will permit.

There has been a growing feeling among American faculties that the rigid division of the curriculum into two years of science and two years of clinical training is a mistake. This feeling is reflected in the almost universal introduction of physical diagnosis in the second year, with, in some cases, introductory clinics or lectures in medicine and surgery, and even elementary clinics in the freshman year.

A good many American educators believe that our curriculum is weak in another and more important respect. They think it is too rigid and that the student has too little responsibility as to the subject matter and order of his education. As I have indicated, I am firmly of this belief and have dubbed our system the grooved rail method of education. Our students are so restricted by the class system, sequence, prerequisites and a filled schedule of required hours that they have no choice but to go forward or be run over.

> "Theirs not to reason why
> Theirs but to do or die."

As I have indicated, the European curricula are suggestive only. In point of fact students deviate widely from the suggested schedules; and the rigid class system of our schools is unknown. Students move freely from one university to another. Many and not by any means the poorest students take a year or more beyond the minimum time. In England the good man uses this time to take "honors" in some subject, or to get the M.D. (not necessary for practice), or to make membership in the Royal College of Physicians.

Here at Minnesota we have done a good deal to break up the military alignment and our schedules are much less rigid than in most American medical schools. We began twelve years ago by shortening our required courses and introducing electives in the sophomore and junior years. Tuesday and Thursday afternoons are supposed to be free from required courses and at this time are scheduled a fair number of advanced and special courses. It is hard to get students to take elective work as seriously as they do the more lengthy required courses, but here at least the students have a choice as to what they will do and that means a personal responsibility. A fair number become interested in one or another department, discontinue their medical work three or more quarters and get a master's degree. Our close association with the graduate school fosters this wholesome movement. A few go on to a Ph.D. The fellowship system helps, and so does the summer quarter. I feel free in asserting that we have here a real school in the fundamental sciences, and not merely adequate departments through which students race as rapidly as possible into the clinical years.

Sometimes I feel that we need much more flexibility and freedom. Sometimes I want to kick the curriculum into the river. Sometimes I want to connect myself with the institution which Professor Howell is going to found as soon as he makes a few million dollars in the teaching profession, a school in which there shall be no admission requirements, no curriculum, no examinations, no degrees—and by inference, I should say, no Registrar and no Dean.

I do feel that we might well shorten our required courses still further and offer still more time for electives. At Minnesota we have had for two years an "Honors Course" with maximum freedom of election. No one as yet has elected this course. Most of the students, I suppose, will go with the herd anyway. Perhaps they go that way in Europe more than appears on the surface. Perhaps responsibility and freedom are a delusion. I do not know and am waiting for the research men of the College of Education to find out, if they can.

LITERATURE

The facts in this paper were derived chiefly from the following sources:

Flexner: Medical education in the United States and Canada. Carnegie Foundation Report, 1910.

Flexner: Medical education in Europe. Carnegie Foundation Report, 1912.

Billroth: The medical sciences in the German universities. Macmillan, 1924.

Flexner: Medical education. Macmillan, 1925.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

CUTTER LABORATORY

Diphtheria Toxin-Antitoxin Mixture 0.1 L^1.

ELI LILLY & COMPANY

Cholera Vaccine, Prophylactic
Plague Vaccine, Prophylactic
Old Tuberculin Human Strain Concentrated
Pirquet Test
Tuberculin Ointment for the Moro Percutaneous Test
Tuberculin T. R. Concentrated Human Strain
Tuberculin B. E. Concentrated Human Strain
Tuberculin B. F. Concentrated Human Strain
Ampoules Glucose (Dextrose U.S.P.) Lilly 10 Gm., 20 c.c.
Ampoules Glucose (Dextrose U.S.P) Lilly 25 Gm., 50 c.c.

H. A. METZ LABORATORIES, INC.

Gynergen
Ampules Gynergen, 1.1 c.c.
Tablets Gynergen, 0.001 Gm.

PARKE, DAVIS & COMPANY

Bismuth Salicylate in Oil-P.D. & Co.

WINTHROP CHEMICAL COMPANY

Tutocain
Tablets Tutocain No. 1 (with epinephrin) 0.03 Gm.
Tablets Tutocain No. 2 (with epinephrin) 0.03 Gm.
Tablets Tutocain No. 3, 0.03 Gm.
Tablets Tutocain No. 4 (with epinephrin) 0.05 Gm.
Tablets Tutocain No. 5, 0.1 Gm.

TRUTH ABOUT MEDICINES

Tetanus Antitoxin for Human Use (New and Non-official Remedies, 1926, p. 333).—This product is also marketed in packages of one syringe containing 10,000 units and in packages of one syringe containing 20,000 units. Cutter Laboratory, Berkeley, Calif. (Jour. A. M. A. Dec. 4, 1926, p. 1917.)

Typhoid Prophylactic (New and Non-official Remedies, 1926, p. 359).—This typhoid vaccine is also marketed in packages of one syringe and in a 20 c.c. bottle. Cutter Laboratory, Berkeley, Calif.

Scarlet Fever Streptococcus Antitoxin Concentrated Globulin–P. D. & Co. (New and Non-official Remedies, 1926, p. 332).—The product is now prepared by the method of Drs. Dick. This product is also marketed in single 1 c.c. vial packages (for the diagnostic blanching test). Parke, Davis & Company, Detroit, Mich. (Jour. A. M. A. Dec. 11, 1926, p. 1999.)

Homocamfin — Cyclosal. 3-methyl-5-isopropyl-Δ2-cyclohexanone dissolved in an aqueous solution of sodium salicylate. Methylisopropylcyclohexanone, the potent constituent of homocamfin, is claimed to have an action similar to camphor, but to surpass it in intensity and rapidity of action on the heart and respiration. It acts almost instantly when given intravenously, hence caution must be used when it is administered in this way. Homocamfin is used as a stimulant in cardiac failure, surgical shock, narcotic poisoning and respiratory failure. The product is marketed in Ampules Homocamfin 10 per cent (for intramuscular use) and Ampules Homocamfin 1 per cent (for intravenous use). Winthrop Chemical Company, Inc., New York.

Tutocain.—Butamin. p-amino-benzoyldimenthylamino-methyl-butanol hydrochloride. Tutocain is a local anesthetic employed chiefly for surface anesthesia and by subcutaneous injection. In experiments made for the Council, Tutocain in 3 per cent solution is about four times as toxic as procaine hydrochloride by rapid intravenous injection into the cat and a fatality has been reported following the injection of 8 c.c. of a 2 per cent solution into the urethra. On the other hand, experiments and clinical trials have been reported in support of the claim that Tutocain is relatively safe for use in surface anesthesia and by hypodermic injection. Tutocain is marketed as: Tablets Tutocain No. 1 (with Epinephin) containing 0.03 Gm.; Tablets Tutocain No. 2 (with Epinephrin) containing 0.03 Gm.; Tablets Tutocain No. 3 containing 0.03 Gm.; Tablets Tutocain No. 4 (with Epinephrin) containing 0.05 Gm.; Tablets Tutocain No. 5, containing 0.1 Gm. Winthrop Chemical Company, Inc., New York. (Jour. A. M. A. Dec. 18, 1926, p. 2093.)

Diphtheria Toxin-Antitoxin Mixture 0.1 L^1.—Each c.c. of the Diphtheria Toxin-Antitoxin Mixture (New and Non-official Remedies, 1926, p. 333) represents 0.1L^1 dose of diphtheria toxin neutralized with the required amount of antitoxin. The product is marketed in packages of three 1 c.c. vials for one immunization; in packages of thirty 1 c.c. vials for ten immunizations; in packages of one vial containing 50 c.c. Cutter Laboratory, Berkeley, Calif.

Pirquet Test.—Tuberculin-Koch (New and Non-official Remedies, 1926, p. 344) marketed in packages of three capillary tubes. Eli Lilly & Company, Indianapolis.

Tuberculin Ointment for the Moro Percutaneous Test.—Tuberculin-Koch (New and Non-official Remedies, 1926, p. 344) marketed in the form of an ointment in tubes containing 2 Gm.

Old Tuberculin, Human Strain, Concentrated.—Tuberculin-Koch (New and Non-official Remedies, 1926, p. 344) marketed in 1 c.c. vials. Eli Lilly & Company, Indianapolis.

Tuberculin, T. R. Concentrated, Human Strain.—New Tuberculin T. R. (New and Non-official Remedies, 1926, p. 347) marketed in 1 c.c. vial packages. Eli Lilly & Company, Indianapolis.

Tuberculin, B. E. Concentrated, Human Strain.—New Tuberculin B. E. (New and Non-official Remedies, 1926, p. 347) marketed in 1 c.c. vials. Eli Lilly & Company, Indianapolis.

MINNESOTA MEDICINE

OFFICIAL JOURNAL MINNESOTA STATE MEDICAL ASSOCIATION, SOUTHERN MINNESOTA MEDICAL ASSOCIATION, NORTHERN MINNESOTA MEDICAL ASSOCIATION, AND MINNEAPOLIS SURGICAL SOCIETY

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its

EDITING AND PUBLISHING COMMITTEE

R. E. FARR, M.D. Minneapolis
JOHN M. ARMSTRONG, M.D. St. Paul
L. B. WILSON, M.D. Rochester
A. A. LAW, M.D. Minneapolis
J. T. CHRISTISON, M.D., St. Paul

EDITORIAL OFFICE
CARL B. DRAKE, M.D., Editor
2429 University Avenue, Saint Paul

BUSINESS OFFICE
J. R. BRUCE, Business Manager
2429 University Avenue, Saint Paul
Telephone: Nestor 1381

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

The right is reserved to reject materials submitted for either editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of $1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

Contents of this publication protected by copyright.

Subscription Price: $3.00 per annum in advance. Single Copies 25c. Foreign Countries $3.50 per annum.

Vol. X FEBRUARY, 1927 No. 2

EDITORIAL

Trachoma or Not Trachoma

The importance of correctness in diagnosis is well illustrated by the recent unfortunate situation at Devils Lake, North Dakota. The story, the final chapter of which may not yet have been enacted, cannot be related here and we hope we may be excused for any inaccuracies which may appear in our version of the situation, but it happened something like this:

Towards the end of last year some school children in Devils Lake, which is not so far from the Ft. Totten Indian Reservation, were found to be suffering from some conjunctival affection. A special physician in the government Indian service was called upon by the local authorities to render assistance in examining the school children of the town. As a result several scores of the children were found to be suffering from an affection of the conjunctiva which was diagnosed trachoma. The children were sent home from school with cards so stating and the parents were advised to have their children operated upon. As a result a considerable number were so operated upon, many (perhaps most) by the trachoma expert.

Not content with the diagnosis made by the authorities some of the local physicians raised a question of the possibility of an error in diagnosis. As a result several children said to be suffering from trachoma were taken elsewhere for medical opinion. Some, at least, of these consultants found no evidence of past or present trachoma and considered the condition to be simple lymphoid hyperplasia or folliculosis.

It is well known that the diagnosis of early trachoma is often most difficult. Many general practitioners find no difficulty in recognizing a long standing case. While the onset may be most acute it often is most insidious, although it is questionable whether the onset is ever so gradual in a child as not to attract attention. The nearby prevalence of trachoma on the Indian reservation doubtless had much to do in starting what became a panic. Several children were excluded from school and the following day developed measles.

Nor is this recent episode alone in the annals of medical history in this country. Similar scares have occurred in New York state, the middle south, and in South Carolina. In the last mentioned state in 1920 some representatives of the United States Public Health Service threw the entire state into a panic and it was a matter of several months before the opinion of the local ophthalmologists as to the non-existence of trachoma was accepted.

Perhaps the best lesson to be learned from such an incident is the importance of procuring the best possible consultation when a contagious disease of such grave importance is suspected. Health authorities have a serious responsibility towards a locality and in an effort to play safe doubtless tend to make a graver interpretation of symptoms than is oftentimes warranted.

The Cleveland Meeting of American College of Physicians

"I belong to ten national societies, besides all our local society groups"—thus wrote a busy confrere within the week, when questioned about the prospects of his attendance at the clinical session of the American College of Physicians, Cleveland, Ohio, February 21-25.

This answer is a fair and reasonable one, yet it has in it a note of needless despair. We might ask our leading retailers how often they send representatives to the great centers and their markets. We may as well come to understand that the practice of medicine cannot safely revolutionize every ten years unless the men who try to keep in their respective communities are willing to attend the great meetings that bring to them and their hospital staffs the current knowledge and opinions which tend to keep our profession vitalized and dynamic. It is not enough that we should have this vital stimulus, but we must be kept safely in line with reasonable, sane practices and beliefs. Reading alone of the splendidly available literature is not enough—we must see and hear the men who teach; we must gain balance and perspective where the written word alone may falsely proportion.

The Cleveland session is to be the eleventh annual meeting, intended primarily for internists and the associated specialties of neurology, pediatrics, roentgenology, pathology, dermatology and psychiatry.

The standards set for membership are high, and many men of distinction in the profession are presently in its membership. Dr. Alfred Stengel, of Philadelphia, heads the organization this year, and with Dr. John Phillips, of Cleveland, is arranging a splendid program—bringing together some of the keenest medical minds in the United States and Canada. Following more recent traditions in medical gatherings, there will be clinics and demonstrations from the various hospitals and laboratories of the Western Reserve University for the morning; the afternoons will be devoted to formal papers and lectures; the evenings will be fully occupied with formal addresses by distinguished guests (American and foreign), and by the president or other representatives of the College.

An invitation has been extended by the College to all qualified physicians and laboratory workers to attend the Cleveland clinical session. This invitation should be accepted by all who may possibly be able to attend.

E. L. T.

Vicious Journalism

A number of years back in a weak moment of interest or was it curiosity, we subscribed (we blush now to admit it) to a magazine known as Physical Culture. A book, the name of which has long been forgotten, was gratuitously included in the subscription and was promptly burned in the furnace. How such a book or for that matter most of the Macfadden publications are allowed in Uncle Sam's mail we do not understand.

Recently a tantalizing (?) subscription offer to the same magazine with another volume thrown in was received with reprints of portions of articles which appeared in a recent number of this same magazine. It seems that B. Macfadden's name should be added to the list of famous syphilographers. He has found a cure, he admits it, which is simple and lies within the human body itself. "Salvarsan and six-o-six," (the new authority apparently does not know the names are synonymous) and mercury and the iodides are useless in the treatment of this disease, and his treatment will cure every case. It does seem remarkable that it remained for a journalist, and a busy one at that judging from the variety of publications he sponsors, to make this startling discovery and to disprove the long list of scientists who devoted their energies to the study of this disease. A reading of the confessions of one Harry A. Mitchell in this same magazine number would doubtless convince the most skeptical, especially as an M.D.'s affidavit as to the presence and cure of the disease is affixed. We are constrained to wonder why B. Macfadden himself didn't make the certification.

If we had not been convinced that B. Macfadden wanted our subscription rather than to enlighten us as he professed we might have learned too, what a throttling organization the A.M.A. really is and how it is forcing allopathy on the citizens of our country. Is it possible that B. Macfadden himself wants to join this A.M.A.?

We believe in the value of physical culture and the care of the human body. But a journal of Physical Culture which proposes a propaganda which will encourage sufferers from syphilis to

neglect treating this scourge in time to avoid the ultimate possible sequelæ of paresis, tabes and aneurysm we heartily condemn. This editor Macfadden evidently believes in the value of publicity, publicity at any cost no matter what contradictory or false statements he makes to get talked about. The harm an individual of this type can do is inestimable. The presumption of his attempt to enlighten members of the medical profession by such false statements becomes an affront.

State Dues

If the rate at which the local secretaries are collecting State dues and turning them over to the State Secretary is an indication of the willingness of the local societies and their members to coöperate with the State Association in putting over the program outlined, it looks as though it would be a success.

To date we have a membership of 1,714 with six societies still out. This is very far in advance of the membership in March, last year. One of the larger societies has secured payment of dues from every member in the district who was a member last year and has not since removed. Aside from this the society has seven new members.

Are you one of the 10 per cent still out in the Societies which have reported?

OBITUARY

Dr. William R. Murray

William R. Murray was born at Marquette, Michigan, April 6, 1869, and died at the Abbott Hospital, Minneapolis, after an illness of eighteen days' duration on December 27, 1926, at the age of fifty-seven.

He received his Doctor of Philosophy degree at the University of Michigan in 1892 and graduated from the Rush Medical College in 1897. His internship was served in the Illinois Eye, Ear, Nose and Throat Infirmary, and he did postgraduate work at Philadelphia in 1899 and in Vienna and London in 1909 and 1914. He practised in Milwaukee for a year after completing his internship.

Dr. Murray came to Minneapolis in 1902, where he began the practice of the specialty of Eye, Ear, Nose and Throat, and became a member of the faculty of the University of Minnesota Medical College. He was associated with the late Dr. Frank Todd for several years in the early part of his career, and in 1921 became a member of the Nicollet Clinic, of which he was medical director at the time of his death.

His connection with the Medical School lasted from 1903 until his death. He was Chief of the Department of Ophthalmology, Otolaryngology and Rhinology, a position which he had held since 1918.

In 1906 he married Elizabeth Eaton of New York, who, with their three children, Gordon, Julian and Mary, survives him.

Dr. Murray was a member of the American Academy of Ophthalmology and Laryngology, of the American College of Surgeons and the American Medical Association. He was at one time president of the Minnesota Academy of Ophthalmology and at another time vice chairman and secretary of the section of his specialty of the American Medical Association. He was a member of the hospital staff of the University and Abbott Hospitals.

He was a member of St. Mark's Episcopal Church, of the Minikahda Club and of the Minneapolis Club, and was a Thirty-Second Degree Mason.

William R. Murray was a man of reserve and of dignity. He was honored and respected by his associates, and those who were privileged to know him well recognized in him a character of rare kindliness and generosity. In his quiet, unassuming way, he did more for the progress of medical education and for the fostering of medical ideals in his community than any one can ever know. All the honors and all the responsibilities which came to him in the course of his industrious career were proof of his real worth, for no one was ever more modest and less self-seeking than he.

The tragic circumstances of his illness and death, following the infection received in the care of a patient, has cast a cloud over our association. The life of this earnest, gentle, gifted man can truly be epitomized in the words, "He died to save another."

The following memorial has been adopted by the Faculty of the Medical School of the University of Minnesota:

MEMORIAL TO

WILLIAM ROBBINS MURRAY, Ph.B., M.D., F.A.C.S.

Professor and Chief of the Department of Ophthalmology and Oto-Laryngology.

Born April 6, 1869—Died December 27, 1926.

There are few friends so genuine, so constant, so simply friends, there are few men in medicine so faithfully, so modestly, so uniformly efficient, there are few teachers so direct, so staid, so sound, as was William Robbins Murray, whose death his friends, his colleagues and his students mourn today.

He was one of those rare

"Souls, without reproach or blot,
Who do His will and know it not,"

and one of those rare associates whom one loves and respects unconsciously, almost as a matter of course, and without sensing either the necessity or the propriety of telling him so; and he was one who loved folks in his quiet unemotional way because they *were*

his fellows and because he never wanted to be at odds with anyone. He was a gentleman in the original meaning of the old term; he was gentle alike in breeding, in manner, and in heart,—and yet he was a man among men.

His work was well done. He died an untimely death in the doing of his duty, without thought of lurking danger to himself, devoted solely, as he always was, to the competent service he could render to the sick.

"To the beauty he has wrought, to the truth that he has taught, to the comfort he has been, to the dream the poets tell," to the land where human love and memory alone can follow him, we must let him go.

It only remains to us to offer to those who loved him most and best, the assurance that we loved him too and that we share with them the sorrow that is most keenly theirs.

Dr. Daniel James Paradine

Dr. Daniel James Paradine of Duluth died at the age of 41 years, Monday, October 18, 1926, following a short illness. Dr. Paradine had undergone an operation and was believed to be improving when he suffered a relapse.

Daniel James Paradine was born at Camden, New Jersey, in 1885. He attended Bennett Medical College in Chicago, graduating in 1911. After serving as staff physician of the Chicago county hospital, Dr. Paradine took up his practice at Cloquet, Minnesota. He moved to Duluth in 1918 following the forest fires which destroyed Cloquet and had lived and practiced there since. He was a member of the house staff of St. Mary's hospital at Duluth and was also a member of his county and state medical associations.

Dr. Paradine is survived by his widow and one brother, John Paradine, Davenport, Iowa.

Dr. Gustavus Adolphus Newman

Dr. G. A. Newman died very suddenly at his home Wednesday evening, December 22, 1926, aged 64 years.

Gustavus Adolphus Newman was born at Brockton, Mass., August 29, 1862. He had lived in Minnesota since 1868. For the past sixteen years he served as physician at the Minnesota state prison.

Surviving are the widow, one daughter, Lolita, and a brother, E. T. Newman, at Goodhue, Minn.

The following appreciation written by a friend of Dr. Newman is taken from a local newspaper:

"In the passing of Dr. Newman, Stillwater has lost a notable character. A student of medicine under the great Dr. Osler, he brought to his calling a keen mind and sympathetic heart. The task of a prison physician is a difficult one. Without sympathy one grows harsh; without insight into character one is imposed on. Dr. Newman with rare ability and rare unselfishness ministered unto all sorts and conditions of men with a judgment that was rarely led astray. Men in the hospital learned to love him for his fidelity and genuine interest in them. I recall the expressions of gratitude of many during the epidemic of the influenza. They would wake at night to see the good doctor bending over them, anxious to relieve their suffering. He was to them no mere official but a true friend.

Intellectually Dr. Newman was of exceptianal gifts. He was a reader of the best books, being especially interested in archeology and history. He had a fine collection of Indian relics most of which he had found himself. Deeply interested in freemasonry, he had given the fraternity long and valued service. Above all he was a sincere and earnest Christian. His faith and trust were at the foundation of that strong and noble and unselfish character which his friends appreciated, but which is all too rare in this heedless, hurrying world. May the memory of his life help many of us to braver and better lives."—Francis L. Palmer.

Dr. Samuel D. Flagg

Dr. Samuel D. Flagg, one of St. Paul's last physicians of the old school, died Saturday, Dec. 25, 1926, at St. Joseph's hospital after a week's illness. He was 88 years old and the oldest practicing physician in St. Paul.

Although forced to retire five years ago because of failing eyesight, Dr. Flagg refused to abandon his offices in the Guardian Life building, where he appeared almost daily until he became ill.

A naval surgeon, serving with the Union forces throughout the Civil War, he resigned after the conflict and came to Minnesota to regain his shattered health. Physicians declared he would not live, but Dr. Flagg practiced medicine for more than half a century. He is believed to be the first physician who practiced in St. Paul.

He was the first doctor to bring a clinical thermometer to Minnesota and the first to perform a cataract operation in this state. He was prominently identified with the enlargement of St. Joseph's and St. Luke's hospitals and his early treatment of insanity cases, the first in Minnesota, was followed by the establishment of the state institution for the insane at St. Peter.

True to the old school of medicine, his practice was always of a general nature and through the age of horse and buggy his tall, thin figure became a familiar sight throughout the rapidly growing city. His practice was a high duty to him which he continued until the age of 83.

He was born at Buffalo, N. Y., August 7, 1838, and graduated from the Jefferson College of Medicine at Philadelphia in 1859. He enlisted in the Navy before the outbreak of the Civil War.

His civic activities came in connection with his work in aiding hospitals as a charter member of the Ramsey County Medical Association.

He also was a member of the Loyal Legion of Civil War Officers, the G. A. R. and the Paladin commandery, Knights Templar.

Dr. Thomas J. Maloney

Dr. Maloney was born in St. Paul, July 18, 1879. He died November 25, 1926. After attending the St. Paul public schools, he received the degree of M.D. from the University of Minnesota in 1901. He practiced medicine at Hunters Hot Springs, Montana, for about two years.

Having decided to specialize in diseases of the eye, ear, nose and throat, in 1910 he studied in Vienna and London for a year and a half and then in New York City for one year. Upon his return he practiced his specialty in St. Paul.

Dr. Maloney served sixteen months in the army during the World War and one year over seas. He served as regimental surgeon of the 206th Infantry, Minnesota National Guard from 1921 to 1925. In 1925 he was appointed State Surgeon of the Guard with rank of Lieutenant Colonel.

At the time of his death he was ranking surgeon of the National Guard, a member of the Ramsey County Medical Society, Minnesota State Medical Association, American Medical Association, The Minnesota and American Academies of Opthalmology and Otolaryngology and chief of the nose and throat department of St. John's Hospital. His fraternal organizations included the American Legion, Masons, and Junior Pioneers.

He originated the organization of the Northwestern Medical Officer's Association of the World War and was its first president.

In 1909 he married Martha L. Rich.

Dr. Maloney was beloved by all who knew him. He never failed to respond to calls for service to the medical profession, and what he did, he did well.

The medical profession of Minnesota has lost a faithful worker and those of us who knew him best, a loyal friend.

Dr. Rudolph Schiffmann

Dr. Rudolph J. Schiffmann, multi-millionaire manufacturer of proprietary medicines, resident of St. Paul for 35 years, died Dec. 23, 1926, at his home in Pasadena, Calif.

He was 82 years old. Mrs. Schiffman, two daughters and two sons, one of whom is Rudolph J. Schiffmann, Jr., survive him.

Born in 1844 in St. Louis, Mo., Dr. Schiffmann was educated in the public schools and Washington and St. Louis universities. After serving through the Civil War as assistant surgeon in the United States Army, he resigned his commission and moved to St. Paul.

Dr. Schiffmann retired from regular practice in 1879 and afterward devoted most of his time to civic projects. He was a member of the St. Paul park board for a number of years and served three terms in the city assembly from 1900 until he resigned in 1905 and moved to California.

Dr. William Harrison Daniels

Dr. William H. Daniels, prominent physician of Crookston, Minnesota, died at the Northern Pacific Hospital in Saint Paul October 14, 1926. Death was due to frontal brain tumor.

William Harrison Daniels was born in Williamsburg, Iowa, in 1887. He received his medical degree at the University of Louisville School of Medicine in 1910. Following a short period of practice in Hamilton, Iowa, Dr. Daniels moved to Crookston in 1915, where he continued in practice until two weeks before his death. Dr. Daniels served in the medical corps during the World War. He was a member of his local, state and national medical organizations and was prominent in civic and fraternal organizations in his own community.

Dr. Daniels is survived by his widow and a son, Harrison, his parents of Williamsburg, Iowa, two brothers and four sisters.

OF GENERAL INTEREST

Dr. W. F. Cantwell of International Falls was elected coroner of Koochiching County at the November election.

Dr. C. A. Smith of Faribault is now in the East, from where he will take a boat trip through the Panama canal to San Francisco.

Dr. Toshiyuki Matsuia, Traveling Fellow from the University of Mukden, Manchuria, China, is spending some time visiting the Mayo Clinic.

Dr. W. A. Meierding, formerly of Springfield, Minn., has associated himself with the Fritsche Clinic, New Ulm, Minn.

Dr. Carl Johnson, who has been connected with The Bratrud Clinic at Warren, recently resigned and has returned to his old home in St. Paul.

Dr. O. C. Strickler has retired from active practice because of ill health and with Mrs. Strickler is spending the winter months at Long Branch, California.

Dr. H. Winnett Orr, of Lincoln, Nebraska, gave the first annual Mayo Foundation lecture in orthopedic surgery in Rochester on January 25. His subject was "Osteomyelitis."

At the recent annual meeting of The Red River Valley Medical Society, Dr. G. A. Morley, Crookston, was elected president and Dr. M. O. Oppegaard was re-elected secretary.

Dr. Albert Fritsche was married to Miss Elsie Marti, both of New Ulm, Jan. 10, 1927. They will spend their honeymoon in Europe. The Doctor will take post-graduate work in Vienna.

Mrs. Jessie Rice Greene, wife of Dr. Charles Lyman Greene of St. Paul, died at her home, Monday, Dec. 27, 1926. The sympathy of the medical profession of Minnesota goes to Dr. Greene in his bereavement.

Dr. H. G. Reineke is superintendent of the Roentgenological department at the Cincinnati General Hospital. Dr. Reineke was formerly associated with his father, Dr. G. F. Reineke, at New Ulm, Minnesota.

Dr. G. C. Thomson, a Fellow in the Rockefeller Foundation who has been in The Mayo Foundation for six months, has gone to Johns Hopkins, where he will continue his fellowship in the Rockefeller Foundation.

Members of the Bratrud Clinic, Warren, Minnesota, have severed connection with The Warren City Hospital and recently opened a private hospital in rooms over The Warren National Bank and the Warren Post Office.

Dr. Daniel H. Bessesen of Minneapolis was the principal speaker at the annual meeting of the Sioux Falls District Medical Society held at Sioux Falls, S. D.,

Dec. 14, 1926. His subject was "Post-partum infection."

Appointment of Paul Fesler of Oklahoma City as the new director of the University hospital at the University of Minnesota has been approved by the board of regents. Mr. Fesler succeeds Dr. Louis E. Baldwin, who died last fall.

Dr. A. G. Wethall has returned from Vienna, where he visited the various clinics, and has resumed his practice with offices at 436 Syndicate Building, Minneapolis. Dr. Wethall's specialty is urology, cystoscopy and consultations.

Dr. George A. Geist will be chief of staff of Ancker hospital, Saint Paul, for the coming year. He was elected to that post at the annual meeting of the staff of the institution in January. Dr. E. V. Goltz was elected secretary.

The staff of the Union Hospital, New Ulm, Minn., has elected the following officers to serve for the ensuing year: President, Dr. Geo. B. Weiser; vice-president, Dr. T. F. Hammermeister; secretary, Dr. Geo. F. Reineke; treasurer, Dr. A. F. Kresske.

Dr. Arthur C. Strachauer has been appointed for a term of three years as head of the Department of Surgery at the University of Minnesota. Dr. Strachauer now will be in charge of both the department of surgery and the cancer institute at the university.

Dr. W. P. Larson, professor of bacteriology and immunology, University of Minnesota, addressed members of the Rice County Medical Society at their November meeting on the subject "The discovery and use of ricinolated scarlet fever immunizing antigen."

Dr. Louis Otto Kunkel, of the Boyce Thompson Institute for Plant Research, Yonkers, New York, gave the first Mayo Foundation lecture in a series on plant pathology and physiology in relation to man, in Rochester, January 14. His subject was "Filtrable viruses."

Dr. and Mrs. F. S. Warren and daughter, Miss Alice Warren, of Faribault, sailed December 14 from New York for a trip around the world. After a stop at Cuba, Panama and California they will sail westward to Hawaii and Japan and return to New York via the Red Sea and the Mediterranean.

A recent report made by a Red Wing physician gives the following statistics for that city regarding births during 1926:

Of the total 258 births 209 were born in hospitals; 254 were attended by physicians, 2 by midwives, and 2 were reported by the parents. In comparison, the statistics for 1908 show a total of 163 births, of which 12 were in hospitals, 61 were attended by physicians, and 102 by midwives.

Dr. George O. Welch, superintendent of the State Insane Hospital at Fergus Falls for 34 years, has resigned his position. Dr. Welch's successor is Dr. W. L. Patterson. The hospital at Fergus Falls is the largest in the state and Dr. Welch is said to be the oldest superintendent or head of any state institution.

The Executive Council of the Association of American Medical Colleges has ordered that the Medical Department of the Graduate School of the University of Minnesota (including The Mayo Foundation) be admitted to membership in the Association of American Medical Colleges, following a detailed inspection made recently by Dr. Fred G. Zapffe, Secretary of the Association.

Dr. Smiley Blanton, head of the Minneapolis Child Guidance Clinic for more than two years, will leave August 1, and in September will become the first professor of child study at Vassar College.

At Vassar, Dr. Blanton will be the first professor to occupy the Francis Skinner Edris chair, recently endowed to furthering study of children. Vassar has a nursery school and child guidance clinic, and the fall will inaugurate a new course including physical, mental and intellectual study. Dr. Blanton will have charge of the mental division of the course.

Abbott hospital in Minneapolis is to have a new $350,000 addition according to plans made known by the committee in charge in January. The new building will be from four to six stories high and will be erected on property adjoining the present hospital plant. It will be a structure 75 by 130 feet and L shaped. A service building 40 by 80 feet is also being planned.

In the addition there will be private rooms, double rooms, operating rooms and laboratories. Architecture will conform with the other buildings in the group. The service building will contain a laundry and the heating plant. When the expansion program is completed, Abbott hospital will have one of the most modern plants in the northwest.

Construction work on the new structures will begin late in the winter or early spring. They will be ready for occupancy late in the year.

Dr. Charles H. Mayo of Rochester was elected president of the Chicago and Northwestern Railway surgeons at the sixteenth annual conference held in Chicago in December. Other officers chosen are: First vice president, Dr. R. F. Campbell, Watertown, S. D.; second vice president, Dr. O. J. Fay, Des Moines, Iowa; member of executive committee, Dr. J. F. Smith, Wausau, Wisconsin; secretary-treasurer, Dr. C. W. Hopkins, Chicago.

A new addition to the Willmar Hospital at Willmar, Minnesota, was completed in January. The addition provides twenty-five more private rooms, giving the hospital a capacity of fifty beds. An elevator has been installed near the ambulance entrance. One half the rooms are furnished with private telephone service, and a "silent" call system has been provided for all the rooms. The Willmar Hospital is conducted by Dr. B. J. Branton and Dr. A. F. Branton.

Dr. H. B. Fralic has been appointed head of the United States Veterans' hospital at Fort Snelling. Dr. Fralic was surgeon in charge of the Aberdeen hospital, Saint Paul, for four years to February 1926, when he served in a similar capacity with a veterans' hospital at Lake City, Florida. Dr. Fralic assumed his new duties January 1, 1927. The new Fort Snelling hospital is to be composed of 22 buildings, will house 500 veterans and will be manned by a staff consisting of 500,

numbering doctors, nurses, attendants and office employes. It has been announced that the hospital will probably not be in complete operation before next summer.

Drs. H. M. Workman, A. D. Hoidale and Warner G. Workman, of Tracy, have recently moved from their former offices into a new $50,000 Masonic building, the doctors and the former Dental Clinic composed of Drs. James, Casselman and Haycock, having formed a Medical and Dental Clinic. The ground floor of the building was arranged according to plans formulated especially for the clinic, the medical men occupying a suite of ten rooms, not including the reception room and ladies' rest room, which latter are used in common with the dentists. The medical suite of rooms includes an *x*-ray room, chemical laboratory and library, and an *x*-ray and laboratory technician is employed.

SECRETARIES ARE TO BE GUESTS OF THE ASSOCIATION

The Council has authorized Dr. W. F. Braasch, president of the Minnesota State Medical Association, to call a Conference of Local Secretaries as guests of the State Association at the Saint Francis Hotel, Saint Paul, Tuesday, February 8, 1927. This Conference will start promptly at 9 o'clock, and is for the purpose of discussing problems of interest to the local secretaries as they pertain to the profession.

It is of the utmost importance that all the Secretaries be present at this Conference. If circumstances are such that it is impossible for the Secretary to be present, then the President of the Society should attend.

ANNUAL CERTIFICATE

Each member of the State Medical Association who has paid his dues, will receive within a short time a mailing tube.

This mailing tube will contain:

1. The Annual Certificate of Membership.
2. One card with a synopsis of the principles of the Minnesota State Medical Association, and
3. Ten paper copies of same.

(1).—The purpose of the certificate is that it be framed and placed in a prominent place in each member's office so that persons entering the office may know that he is a reputable member of the medical profession.

(2).—The card with the synopsis of the principles of the Minnesota State Medical Association should be hung near or on the frame containing the certificate of membership.

(3).—The other ten copies are to be distributed in any manner thought best.

The above is a partial answer by the officers of the Association to criticisms that the public do not know what the State Medical Association stands for; nor are the public able to determine who are members of the State Medical Association.

The certificate of membership should be framed and hung in a prominent place. The framing will cost about fifty cents; the frame should be made so that the next Annual Certificate can easily be inserted. This will let the public and individual patients know that the member owning the certificate is considered a reputable physician by the other members of his profession.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

STATE MEETING

The annual meeting of the Minnesota State Medical Association will be held at the new Hotel Duluth, Duluth, Minnesota, Thursday, Friday and Saturday, June 30, July 1 and 2.

The House of Delegates will meet Thursday morning, June 30, and the scientific sessions will begin Thursday at 2 P. M. and will continue until Saturday noon, July 2.

Thursday evening will be devoted to the usual Medical Economics meeting and the annual banquet will be held Friday evening, to be followed by a dance.

The program committee has arranged for a number of symposia on various subjects including Immunization and Acute Infectious Diseases, Pulmonary Tuberculosis, Gallbladder and Liver, the Gastro-Intestinal Tract, the Heart. Clinics on skin, neurological and hypertension patients as well as a demonstration of functional liver tests are also scheduled.

The Women's Auxiliary is preparing an attractive program. Miss B. C. Keller, lay educational director of the Illinois Association, will address the Medical Economics meeting and the Women's Auxiliary.

THE MINNEAPOLIS SURGICAL SOCIETY

The regular monthly meeting of the Minneapolis Surgical Society will be held at the University Hospital at 8:00 P. M. on Thursday Feb. 3. The meeting will consist of a presentation of cases from the University Hospital and Cancer Institute.

A fine program has been arranged by the Staff and all physicians are cordially invited.

HENNEPIN COUNTY MEDICAL SOCIETY

Officers and committees elected for 1927 at the annual meeting of the Hennepin County Medical Society held Jan. 3, 1927, are as follows:

President, Dr. Stanley R. Maxeiner; first vice president, Dr. A. E. Hedback; second vice president, Dr. C. O. Maland; secretary-treasurer, Dr. Erling Hansen; librarian, Dr. T. A. Peppard (re-elected); executive committee, for three years, Dr. Fred A. Erb, Dr. A. S. Hamilton; board of censors for three years, Dr. J. M. Hayes, Dr. Douglas Wood; board of trustees for three years, Dr. A. W. Abbott (re-elected), Dr. W. A. Jones (re-elected).

Delegates to State Convention, 1927, are: Dr. W. A. Fansler, Dr. E. K. Green, Dr. W. A. Jones, Dr. Ralph Knight, Dr. E. A. Loomis; with the following as alternates: Dr. Frank Hacking, Dr. J. P. Hiebert, Dr. C. C. Kennedy, Dr. H. M. Lee, Dr. J. A. Myers.

WASHINGTON COUNTY MEDICAL SOCIETY

The regular monthly meeting of the Washington County Medical Society was held Tuesday evening, Jan. 11, 1927, at 6:30 P. M., with a dinner at the Grand Cafe in Stillwater. Dr. J. F. Savage of St. Paul was the principal speaker and his talk was followed by a general discussion.

SCOTT-CARVER COUNTY MEDICAL SOCIETY

The Scott-Carver County Medical Society held its regular meeting at Belle Plaine, Minn., Thursday, Dec. 2, 1926.

Following its business meeting Dr. M. Ghent of St. Paul gave an address on the subject, "Focal Infections in Relation to the Heart."

Dr. E. M. Hammes, St. Paul, gave an instructive discussion on the subject of the "Present Situation of Epidemic Encephalitis."

The Belle Plaine physicians entertained the society at a banquet following the scientific session.

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

The West Central Minnesota Medical Society held its annual meeting at Graceville, Dec. 11, 1926.

Dr. C. I. Oliver acted as host to the members of the society and their ladies at dinner.

Election of officers for the coming year resulted as follows: President, Dr. C. F. Ewing, Wheaton; vice president, Dr. Chas. Bolsta, Ortonville; secretary and treasurer, Dr. H. Linde, Cyrus; delegate, Dr. Chas. Bolsta, Ortonville; censors, Dr. E. A. Eberlin of Glenwood and Dr. H. J. Shelver of Ortonville.

After the business meeting Dr. J. M. Arnson of Graceville presented a very interesting clinical case to the society, and a general discussion followed.

The next meeting of the society will be held at Wheaton, Feb. 19, 1927.

RICE COUNTY MEDICAL SOCIETY

At the annual meeting of the Rice County Medical Society held at Faribault in December the following officers were elected for the coming year: President, Dr. C. A. Traeger, Faribault; first vice president, Dr. F. R. Huxley, Faribault; second vice president, Dr. F. J. Lexa, Lonsdale; secretary-treasurer, Dr. C. J. Plonske, Faribault; censor for three years, Dr. Joseph Moses, Northfield; delegate to state meeting, Dr. F. S. Warren, Faribault; alternate, Dr. D. E. McBroom, Faribault.

The proposed Basic Medical Practice Act was discussed by Dr. F. J. Savage, Dr. J. T. Christison and Dr. E. A. Meyerding, all of St. Paul, with members of the Society.

JOB FOR A GOOD SAMARITAN

A live-wire salesman rushed up to the home of a doctor in a small village about 3 a. m. and asked him to come at once to a distant town.

The doctor cranked his flivver and they drove furiously to their destination.

Upon their arrival the salesman asked, "How much is your fee, doctor?"

"Three dollars," said the physician, in surprise.

"Here you are," said the salesman, handing over the money, "the blamed garage keeper wanted $15 to drive me over when I missed my train."—Keystone Motorist.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of November 10, 1926.

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 10, 1926, at 8 P. M. Dinner was served at 7 P. M. The meeting was called to order by the President, Dr. F. E. Burch. There were twenty-eight members and three visitors present.

The minutes of the October meeting were read and approved.

A motion was carried that the President appoint a Committee to draw up resolutions on the death of Dr. L. B. Baldwin, an Honorary Member of the Academy.

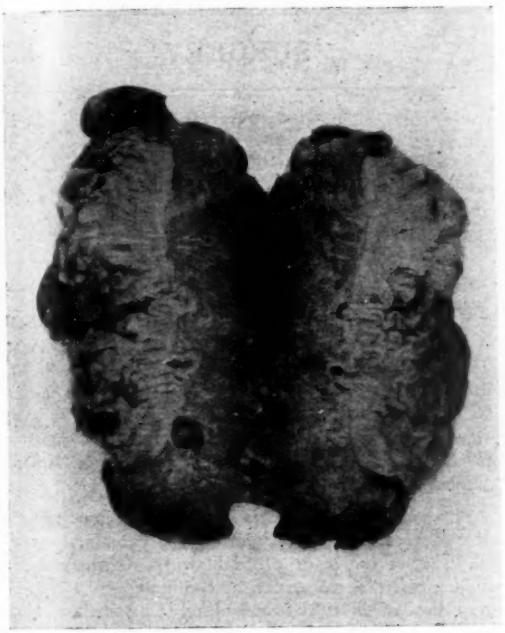
DR. ARNOLD SCHWYZER (St. Paul) reported two cases as follows:

1. The first case I wish to report is of a man seventy-two years old, who was brought to me by his doctor, who had operated on him eight weeks before. At that time a severe intestinal obstruction had existed, and a median laparotomy over the lower aspect of the abdomen was made. The obstruction was found to be due to a large mass at the junction of the sigmoid with the rectum. The bowels being enormously distended, it was wisely decided not to do more than a colostomy. Since the relief of the obstruction, the patient improved considerably and the doctor wanted me to see if an extirpation could and should be done. Accordingly the abdomen was reopened on May 3, 1926. The mass was found to be bulky and reached from the middle of the left linea innominata to the promontory and from this level downward into the pelvis. Boggy irregularities like packages of large lymph nodes outlined the mass toward the promontory and the whole was fixed to the pelvic wall. It looked as though we were going to get into collision with the left common iliac vessels and the ureter, and we decided that the man was better off with his colostomy and an attempt to hold the growth in check by radium. The abdomen was closed. In case the mass should be inflammatory it was best to leave the old man alone for the present, and after a prolonged rest things would become more favorable for operation on account of the colostomy. If the mass was malignant, the case was inoperable; and we inclined toward this diagnosis.

On September 20th, after my return from the summer vacation, the patient was re-examined. We were struck by the splendid appearance of the man, who was however quite unhappy with his colon fistula, and wanted it closed if there was a possible chance. We tried to tell him that hundreds of people were living quite comfortably with a colostomy, and that just then we had heard from one of our patients that she was feeling fine and happy with her colostomy seven years after the operation (excision of the rectum for carcinoma). Of no avail; he wanted to take the chances of resection and closure of the anus preter naturam. With his seventy-two years he declared he was not old enough to stay at home; he wanted to meet his friends

socially and to feel clean. Here was a reason for re-operating, though we should have preferred to wait longer. It was by now more probable that we had to deal with an inflammatory condition, *i.e.*, a diverticulitis.

An *x*-ray examination showed a complete obstruction and, indeed, not even a drop of water came from the colostomy opening when an enema under three feet of pressure was given per anum. The finger, inserted through the colostomy, and palpation of the abdomen made us feel that the tumor mass was considerably smaller, and perhaps operable.



Specimen, Case 1 (Dr. Schwyzer).

On September 22nd, the mass was excised. The thickening reached so close to the colostomy that a reliable and clean suture seemed impossible. The stump from the colostomy down to the upper line of resection was not longer than about two and a half inches and was, of course, fixed far over to the left. This made it insufficiently accessible from our right rectus incision. A Murphy button here rendered good service. The larger half was introduced into the lower opening, which seemed however barely large enough for the button.

Though the post-operative course was perfectly smooth for the first two weeks, on the 15th post-operative day (October 7th) the patient had some pain in the pubic area and fever of 100 degrees was recorded. We became anxious to get that Murphy button, which on account of a lack of a *vis a tergo* might stay there indefinitely and might cause an ulceration in this firm tissue of reduced vitality and elasticity, because considerable quantities of radium had been administered. On October 9th the colostomy was widened by incision and the finger could reach the button. A strabismus hook could be introduced into the lumen of the button and, with a good amount of patience, taking care not to cause pain, the button was delivered through the colostomy opening. A colostomy closure was made, but had to be undone the next day as flatus went into the subcutaneous tissue and caused an emphysema of scrotum and penis which persisted for over a week. The patient left for his home on October 24th. (Note: We saw him again on November 18th, when the colostomy opening was practically closed.)

The specimen, as you see here, is about 4 inches long. There exists no ulceration of the mucosa anywhere, though water would not even now go through it. A longitudinal section struck three diverticula imbedded in bulky, infiltrated and hard fatty masses. Two of the diverticula contained hardened fecal matter, hard enough to be called stones. When the photograph was made one of these stones had been lost.

2. The second case is one of hydrops of the renal pelvis showing no communication with the kidney; therefore not hydronephrosis, but hydropyelon, a congenital anomaly. This will be reported later after further study.

Dr. C. Eugene Riggs (St. Paul) read a paper entitled "Notes on Epidemic Encephalitis." (See page 100.)

Dr. R. E. Farr (Minneapolis) read a paper entitled "Shortcomings in Cleft Lip and Palate Surgery and Suggestions for Meeting Them." (See page 70.)

The meeting adjourned.

Carl B. Drake, M.D.,
Secretary.

TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY

Meeting of December 2, 1926.

The regular meeting of the Minneapolis Surgical Society was held on Dec. 2, 1926, at the library of the Hennepin County Medical Society. Meeting was called to order by the President, Dr. E. C. Robitshek.

Dr. C. M. Roan of Minneapolis presented the following case, which was felt to be of interest in connection with the topic of the evening.

The patient is a farmer, aged 54, who presented himself for examination on December 18, 1925. His family history is negative in every respect. His only complaint at the time was that of an uncontrollable itch and a deep jaundice. In July and August, 1925, he had suffered what he termed "weak spells." Had seen his family physician and had been sent back to work, as much as he was able to. Had experienced no nausea, no distress after meals but an uncontrollable diarrhea. Appetite always good. Had not been aware of a swelling in the epigastrium. When he came for

examination he was in a very poor condition. He had a deep copper colored hue with eyes as deeply jaundiced as the skin of an Indian. Lost weight from one hundred forty-five pounds to one hundred nineteen.

Blood Pressure: 92/64. *Coagulation time:* 9 minutes, 20 seconds. *Wassermann:* negative. I cystoscoped him to rule out right kidney and fluoroscoped him to rule out the stomach. Patient was advised to go home as other physicians had told him. He presented himself again two weeks later, December 30, 1925, when his condition was found even more aggravated. At that time the liver was very much enlarged and engorged but I could make out what I believed to be the gallbladder. Patient extremely emaciated and jaundiced. Patient was told that if he cared to risk it, I would tap the gallbladder under local anesthesia. This was done on the following day, December 31, 1925. Engorgement of the liver subsided and he felt better. Drained freely until February. My intention was to give him whatever relief surgical procedure could afford him. Diagnosis: 50 per cent malignancy although any primary lesion could not be found, 25 per cent cyst in liver, 25 per cent chronic pancreatitis. When he had gained sufficient strength I recommended an exploratory operation under gas and ether, which he underwent. I promptly closed him, as the pancreas had the feeling of a frozen fish. Could trace it from head to tail. On March 15, 1926, he consented to further surgical measures, at which time I did a cholecystduodenostomy by the suture method. Patient was discharged from hospital April 14, 1926. Traveling home by auto he developed an orchitis. I felt that this was a possible indication that the pancreatic enlargement was inflammatory rather than malignant. His present condition is good. Weight today one hundred thirty-eight pounds. Appetite good. Has an uncontrollable desire for tobacco. Post operative hernia at present time only handicap. Doctor James Johnson saw him prior to the last operation and can verify, if desired, my synopsis of the case.

The address of the evening was delivered by Dr. John B. Deaver of Philadelphia on the subject "Chronic Pancreatitis" (illustrated by lantern slides). His paper is printed on page 65 of this issue.

THEODORE H. SWEETSER, M.D.,
Secretary.

ENTEROCAP ORALSULIN

This is advertised by the Lafayette Pharmacal Company as "a product of the Pancreas of young food animals that is designed for use as an adjunctive treatment of Diabetes Mellitus." From this and other statements it appears that it is claimed to be a preparation containing insulin put up in enteric coated capsules for oral administration. Even if one could be sure that the insulin said to be present would arrive in the intestine unharmed, the weight of evidence is against its probable effectiveness. There is no convincing evidence to show that any preparation taken by mouth is an effective means of producing the characteristic action of insulin. (Jour. A. M. A., Dec. 4, 1926, p. 1935.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SURGERY

SUPERVISORS:

DONALD K. BACON,
LOWRY BLDG., ST. PAUL

VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

SARCOMA OF THE PROSTATE: REPORT OF A CASE WITH A DIGEST OF THE LITERATURE: Richard R. Smith, M.D., F.A.C.S., and William R. Torgerson, M.D., Grand Rapids, Mich. (Surg. Gynec. and Obst., 1925, XLIII, No. 3, 328). In a review of the literature the authors found 83 cases of sarcoma of the prostate had been reported and to this number they added their own case.

The case reported in this article was a married man 31 years of age. He reported for examination two weeks after the onset of first symptom, which was a sudden retention of urine; he continued also to have a great deal of difficulty in urinating. On rectal examination, he was found to have a large, smooth mass in the prostatic region, and on cystoscopic examination, equal bulging was seen at the base of the bladder. The tumor was removed through the perineum and the pathologist reported sarcoma. Deep *x*-ray therapy was given without success. Death occurred about four months after symptoms began. At autopsy, recurrence was found which projected from perineal wound and almost filled the pelvis, invading bladder, urethra and rectum. Metastases found in lymph glands, fourth lumbar vertebræ, tenth rib, pleuræ and both lungs.

The authors find that the statistics from the literature vary from the teachings of the text-books in regard to the age at which sarcoma of the prostate is found, the relative malignancy of the various types, and the location of metastases. In the cases reported 30.5 per cent occurred during the first decade and 60 per cent during adult life, which disproves the idea that it is always a condition found in infancy and childhood.

Clinical picture was found to vary little whether it occurred in child or adult. Usually the first symptoms were difficulty or complete retention of urine or partial obstruction of bowel and later pain in pelvis and limbs, hematuria occasionally and sometimes tumor

would fill the whole pelvis. Histologically many types have been described; but the round cell is the most frequent, constituting 36 per cent, and next in frequency is the spindle cell, 20.4 per cent. Metastases found most frequent as local extensiton, but were found in nearly every organ of the body.

Duration of life after first symptoms were noted varied from eleven days to twenty-four months. Palliative treatment was thought to be the best treatment at the present time.

M. P. OMOHUNDRO, M.D.

EXTERNAL FECAL FISTULÆ IN ACUTE APPENDICITIS: Ralph Colp (Ann. Surg. 1926, 84, 837-840). During the past decade 36 per cent of the cases of acute appendicitis admitted to the surgical wards of the Mount Sinai Hospital have been complicated by abscess formation or general peritonitis. This is a serious indictment of the laity in general and the profession at large. It means that drastic purgatives are still administered promiscuously for abdominal pain and that the ice-bag and watchful waiting take their ultimate toll in death. Willis has recently called attention to the fact that appendicitis is responsible for a large proportion of surgical deaths and that the mortality has increased within the past number of years. Unpleasant complications also are not rare.

In 2,841 consecutive cases of acute appendicitis seen at the Mount Sinai hospital 33, or 1.1 per cent, developed fecal fistula. It is usually incident to vascular thrombosis or inflammation of some part of the terminal ileum or cecum, resulting in the sloughing of the intestinal wall. While it is most frequently seen in cases of acute gangrenous appendicitis with perforation and abscess it may be due to poor surgical procedures.

Rough manipulation through a small, inadequate incision may be a factor, as well as improper or poorly placed drainage producing pressure necrosis of an inflamed bowel wall. Unprotected gauze and hard, unyielding rubber or glass tubing are much inferior in this respect to soft pure gum tubing. Inversion of the appendiceal stump may lead to the formation of fistulæ by strangulating the blood supply, by pressure necrosis or by the formation of a hematoma or abscess. The simple "drop method" of caring for the stump, which is almost routinely employed at the Mount Sinai hospital, is simple and carries with it a low incidence of fecal fistulæ.

When a fistula occurs drainage tubes should be shortened or removed as soon as possible, or softer and smaller tubes substituted and the surrounding skin protected by suitable dressings. The diet should be constipating. The majority of fistulæ occur within the first two weeks after operation. They will usually heal spontaneously, only 12 per cent, or 4 cases in the series of 33, requiring operative interference.

HAROLD E. SIMON, M.D.

PEDIATRICS

SUPERVISORS:
CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS
ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

HEMATOLOGICAL STUDIES OF PREMATURE BABIES DURING INFANCY WITH PARTICULAR REFERENCE TO ANEMIC CONDITIONS: A. Lichtenstein, M.D. Abstracted by Bernard S. Denzer, M.D. (Archives of Pediatrics, November, 1916). Hemoglobin and red blood cell values in the majority of new-born prematures agree with those in full-term infants. Fetal characteristics are present to a higher degree in the smears of new-born prematures than in those of new-born full-term infants.

Uniformly during the first two months of life, prematures develop an anemia which warrants the term, hypoplastic anemia.

The low red blood cell count found during the first few months improves spontaneously during the second quarter of the first year. On the other hand, during the same period low hemoglobin values remain unchanged, probably on account of the lack of material for hemoglobin formation, in other words, a too small congenital iron storehouse.

Alimentary anemia is developed by a one-sided milk diet, probably on account of lack of iron in the food and depletion of the congenital iron depot. Because of the congenitally small iron storehouse, prematures are particularly predisposed to alimentary anemia.

The condition has been called "chlorosis," and has a good reaction to iron therapy. Czerny did not find the chlorotic type of blood picture to be constant and iron therapy was of no value. Cure can be accomplished by the reduction of milk and the substitution of a mixed diet; this therapy may require months to be effective. Prolonged nutritional disturbance should not be excluded as a possible contributing factor in the production of alimentary anemia.

In conclusion, Lichtenstein states that upper respiratory, as well other infections, tend to produce or enhance an anemia, and that this effect varies, depending on the constitution of the child and the virulence and duration of the infection.

If one recalls that iron is stored in the infant during the latter part of pregnancy, it becomes easy to think of prematurity as a cause of alimentary anemia. When the congenital iron supply is low, an alimentary anemia will occur early. When the supply is normal, as in full term infants, anemia will occur if the iron-poor milk diet is continued after the usual period of lactation. In this way one may explain the early oligochromemia of prematures and the later anemia of full term infants.

Alimentary anemia appears in forms varying from a chlorotic-like blood picture to that of so-called pseudoleukemic anemia. The latter type of anemia (pseudoleukemic) is considered to be a severe stage of in-

fantile anemia. Prematurity is often an important pathogenic factor in its development.

Medicamental iron therapy in large doses has a curative effect on the anemias of premature infants. Iron is well tolerated. Medicamental iron therapy has a good effect in alimentary anemia even without reduction in the amount of milk in the diet.

In cases classed as pseudoleukemic anemia, iron also shows good results.

R. N. ANDREWS, M.D.

NARCOLEPSY—A SYMPTOM COMPLEX: A. A. Weech, M.D. (Amer. Jour. of Diseases of Children, November, 1926). There are two symptoms which characterize narcolepsy: (1) The patient has a tendency to go to sleep at frequent intervals through the day, (2) the patient may find that any emotion causes a feeling of generalized weakness, so that his knees may give way under him and allow him to fall.

Typical narcolepsy runs a chronic course. In some of the cases, however, improvement has been noted under different forms of therapy, but unfortunately most of them have been observed for short periods only and the ultimate outcome is not on record. It is interesting that most of the reported cases refer to males of adult age.

Soporific drugs, given to deepen the sleep at night, have had no effect in relieving the patient by day. Up to the present time there is no accurate knowledge concerning the etiology of this affection.

It is likely that narcolepsy does not represent a disease sui generis, but is rather a syndrome or symptom complex depending on injury of a definite area in the brain.

R. N. ANDREWS, M.D.

ROENTGENOLOGY

SUPERVISORS:
LEO G. RIGLER,
MPLS. GEN'L HOSPITAL, MINNEAPOLIS
A. U. DESJARDINS,
MAYO CLINIC, ROCHESTER

OSTEOPETROSIS: Karshner (Am. Jour. Roent. November, 1926). A new name is advanced for this condition previously known most commonly as "marble bones." The disease is defined and its history is briefly given. The author has carefully studied the literature, and finds only 18 authentic cases on record. The essential features of each case are briefly reviewed and 4 additional cases are reported.

The causative factor is heredity, and this is assumed to be a primary mesenchymal dyscrasia leading to abnormal and excessive bone-building. The pathology is a diffuse malformation of bone and cartilage manifesting itself as a disturbance of ossification. Grossly there is the increase of hard, cortical bone to more than twice the normal thickness, with condensation and broadening of the bone trabeculæ, obliteration of the spongiosa by the encroaching compacta, and crowding of the marrow elements, often with replacement by fibrous tissue.

The roentgen findings are unique, with involvement of the entire osseous system. The term "marble bone" is fairly descriptive. There is obliteration of the medullary cavities, solid dense bone in place of the pneumatic structures of the skull, and various other bone deformities and abnormalities, comparable with the pathology. The bone itself is very brittle and spontaneous fractures are common.

WALTER H. UDE, M.D.

IRRADIATION OF DISEASED TONSILS: J. Coleman Scal (Med. J. & Rec., 124:873, Dec. 1, 1926). This article describes a new method of treating tonsillar hypertrophies by means of removable platinum radon seeds, giving detailed reports of a series of cases where tonsillectomy was for different reasons contraindicated, and illustrating the application of the technic to varying pathological conditions.

To carry out the application of the seeds, a new implanter is used which is illustrated and described in the article.

As the pain of implantation and removal is practically *nil*, at no time is any anesthetic required, there is no need of hospitalization, nor disability of any kind. The total absence of shock is a great advantage in inoperable cases.

By means of the implanter the operator is able to place one removable radon seed in the center of a tonsil so that radiation is distributed equally throughout. The radon seed used is filtered by 0.3 mm. of platinum. This filtration cuts off the caustic Beta rays, thus doing away with all possibility of burning with consequent necrosis and sloughing.

When the instrument is withdrawn after implantation the seed is left imbedded in the tonsil with a 2 cm. length of thread protruding from the portal of entry. This short thread does not in any way inconvenience the patient, nor cause the slightest interference with function. At the end of four days the seeds are easily removed by grasping the thread with forceps.

The point of the trocar is so fine and the seed so small that very little trauma is done to the tonsil.

The amount of radiation can be measured with accuracy and the applicators located with such exactness as to insure equal and complete distribution throughout the tissues. Only one treatment is necessary, a fact much appreciated by the patient. Systemic reactions of any kind never occur. The attached thread, making the seed easily removable when its period of service is over, does away with an objectionable foreign body being left in the tissues—a drawback to the bare tube method. The author concludes that in the implantation of removable platinum radon seeds we have at present an adequate substitute for tonsillectomy in those cases where surgery is, for any reason, contraindicated.

The technic and method described in the article have been developed by Dr. Joseph Muir of New York.

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

SUGGESTIONS ON THERAPY OF THE POST-ENCEPHALITIC PARKINSON SYNDROME

REPORT OF TWO CASES

C. EUGENE RIGGS, M.D.
Saint Paul

The Parkinson syndrome occurs in 25 per cent of the cases of epidemic encephalitis (Hall). The expressionless face, the staring look, the monotonous voice, the stiff, shuffling gait, the short steps, the arms held motionless by the side and the distinctive position of the hands, the peculiar posture of the body, the sialorrhea and the increased pulse rate present a characteristic picture never to be forgotten. This syndrome may develop during the acute illness or months or years (as long as five years) after its occurrence. There may be no recognizable initial illness, as the two cases which form the basis of this report demonstrate. The syndrome may be incomplete, namely, limited to the face, an arm or a leg or hemiplegic in type. The partial cases are more hopeful than when the musculature of the entire body is affected. The failure in muscular power is markedly less than in ordinary paralysis agitans. The syndrome usually becomes stationary and the patient a permanent invalid. Improvement may occur spontaneously, only to be followed by a great increase in the rigidity, or complete recovery may take place.

Treatment is purely empirical and thus far has proved most disappointing. The therapeutic agents most promising are nicotine and the atropine group. Moll has used nicotine in thirteen cases of post-encephalitic Parkinsonianism. Nine showed improvement; four were not benefited. The former stated that "their joints felt looser and that their limbs were freer." The initial injection was 1/30th grain given three times a day. This is continued for a few days if the pulse shows no appreciable change; the dose is then increased gradually until a tenth or a fifth of a grain is reached. This dosage may be maintained for several weeks unless intolerance becomes apparent. Nicotine does not influence the tremor or the sialorrhea. Six months after its discontinuance, all of Moll's nine patients had relapsed into their previous condition. While immediate lessening of the hypertonia was noticed, no worth-while benefit was observed.

The improvement to be obtained by the use of the atropine group, as advised by Hohman and Hall in the encephalitic Parkinson syndrome, is in the experimental stage; its possibilities and permanency are yet to be determined. In eighteen cases, in which hyoscine hydrobromide was used by Hohman, there was slight improvement in six; a definite improvement in five, while in seven it was marked. Some of the patients were able "to attend to personal wants after being bed-ridden and helpless." The disappointment of some of us with hyoscine has probably been due to our reluctance to prescribe so potent a drug when the patient was not under our immediate observation. In half of the cases in which scopolamin was used by Kennedy, Davis and Hyslop, they observed there was a lessening of the rigidity, a restoration of the facial mobility and that the patients were generally more comfortable. Gelsemium, they found, had an effect similar to that of scopolamin and in the same proportion of cases. The former, they believe, is to be preferred over the latter because "it can be used for an indefinite time and has none of the dangerous concomitant effects of the latter."

Hall used belladonna in nineteen cases. Six derived no benefit; three showed no objective evidence of improvement, although the patients reported themselves as feeling better; as to the benefit in ten there was no doubt. In some cases the improvement was astonishing, amelioration being noticed a few days after treatment began. Foster Kennedy reports a striking therapeutic result in a middle-aged Parkinsonian who could neither articulate, chew nor move her arms or legs voluntarily, yet after the use of a suppository of belladonna of "tolerance dosage," she could talk fluently, move quickly and gracefully and express her emotions in a normal manner. While the respite was but temporary, yet the same response was invariably obtained.

Case 1.—Miss H., aged 20, three years ago experienced a dull pain in the right arm. This lasted a week; then lethargy occurred which persisted three months. There was blurring of vision but no diplopia and no fever. There was, however, a distressing sialorrhea. Two years later the Parkinson syndrome appeared. In February 1926, tremor appeared in both arms, more marked in the right than the left, so severe as to make eating difficult. Her face was expressionless, eyes staring, mouth open, gait, attitude and carriage characteristically Parkinsonian. Her body was bent over as in extreme age. She was unable to chew her food. She lived on liquids; when she attempted to masticate, the lower jaw would drop and she was unable to control its movements. Shortly after the administration of belladonna a noticeable lessening in the hypertonia was apparent. The sialorrhea is no longer annoying; she walks erectly, shoulders drooping if tired; the mouth is usually closed; tremor markedly less; facial expression almost normal; she goes and comes from the toilet unaided. There has been a great change for the better in her ability to masticate. She can now chew her food for a few moments; after a brief rest she is able to resume eating. The muscular tone as shown by the capacity of the limbs when brought by passive movements into a new position was noted to observe whether they would so remain after release. The "shortening and lengthening" which was present when first examined has completely disappeared. She is taking thirty drops three times a day without any symptoms of intolerance manifesting themselves.

Case 2.—Mr. L., aged 25, a patient of Dr. Hengstler's. There was no history of an initial illness. The first symptom was a failure of speech; he could not talk above a whisper. Associated with this was difficulty in deglutition and an inability to masticate his food. After chewing for a few minutes the lower jaw would drop. The face was expressionless and the hypertonia of the muscles was confined to the right side—a hemi-parkinsonian syndrome. Added to this is a paresis of the right arm and leg. His gait was staggering and when walking he dragged his right foot. From the beginning of his illness he has complained of feeling weak and exhausted. The significant feature of his illness is the personality change. This has been characterized by irritablity, fickleness and his inability to appreciate properly domestic and social amenities. The surprising thing is that this behavioristic change did not suggest the true nature of his illness. Under belladonna therapy the most remarkable improvement has taken place in this patient. He is taking thirty drops of the tincture three times a day. His facial expression is practically normal; speech has greatly improved. The hemi-parkinson syndrome has disappeared. He walks much better and no longer drags his right foot. He eats without difficulty and the sialorrhea has ceased.

Hall believes that belladonna, by its influence on some part of the neuromuscular area, relieves the hypertonia and, as it were, knocks off the Parkinsonian shackles from the muscles; the higher nervous centers, being thus unfettered, will do the rest. There can be no question as to the therapeutic importance of the atropine group—belladonna and hyoscine. The former, Hall regards as the more efficient. The value of nicotine is highly problematical. There is in the Parkinsonian a marked psychic factor which is influenced to a greater or lesser degree by the various forms of therapeutic approach. The atropine group would appear to offer the greatest relaxation of the hypertonia, relieving the "tied by the muscles feeling" which paralyzes all initiative and spontaneity of action—most distastrous psychically to the patient—and creating thereby a feeling of hopefulness most helpful and beneficent.

"He who begins in certainties," says Bacon, "will end in doubt, and he who begins in doubt will end in certainties." Our belladonna therapy in the encephalitic Parkinson syndrome began in doubt and we are far from ending in certainty, yet the improvement in these two patients has been surprising, rapid and remarkable. If such a notable amelioration can be obtained in a certain percentage of Parkinsonians, although its use be necessary intermittently or continuously, belladonna is a drug of priceless value to this class of hitherto handicapped, helpless and bedridden cases. While belladonna probably has no curative influence on the pathological state underlying the Parkinson syndrome, it does favorably modify its reactions on the nervous mechanism. As to the character, extent or ultimate benefit arising from this modification, we are absolutely ignorant. This therapeutic adventure, judging from the literature and our limited experience, is well worth trial.

MYOSITIS OSSIFICANS

CASE REPORT

HUGH T. JONES, M.D.
Rochester, Minnesota

This case is presented because of the relatively rare incidence of myositis ossificans and because of the confusion that exists in differentiating it from sarcoma.

The patient, a young woman aged nineteen, came to the Mayo Clinic February 1, 1926, because of a swelling of the anterior part of the right thigh. One month previously she had noticed "cramps" in the right thigh when her knees were drawn up at night. There was no history of trauma. Three weeks before examination the patient felt something pressing on the muscle of the thigh and she believed there was something between the muscle and the bone. About three days later she began to have trouble walking downstairs and limped when she tried to run. There was no pain but motion of the leg was impeded. She had not lost weight or strength. A physician was consulted who thought that there might be a collection of fluid in the thigh. Aspiration was attempted but was not successful.

Physical examination revealed a firm, sensitive, poorly defined mass in the anterior part of the left thigh. The muscles seemed to move over this. The roentgenogram (Fig. 1) disclosed an area of increased density in the muscles anterior to the femur, suggestive of ossification or calcification.

In order to establish a diagnosis an exploratory operation was performed and a mass measuring 4 by 3 by 3 cm. was removed from the rectus femoris. On gross section it was seen that laminæ of bone were arranged in plaques running longitudinally between zones of muscle tissue. Microscopic examination of a section of the decalcified specimen revealed these strata of spongy bone interspersed between, or else replacing, the disintegrating fibrotic striated muscle. The spicules of bone were lined by a definite row of osteoblasts (Fig. 2).

DISCUSSION

Noble recognized three main types of myositis ossificans: (1) myositis ossificans progressiva, occurring mostly in young persons, invading first one muscle and then another; (2) myositis ossificans conscripta, of which the "rider's bone" is an example, illustrating the formation of bone in a muscle which is subjected to long-continued and often-repeated injury or irritation, and (3) a localized form of myositis ossificans; in this type are included the cases of myositis ossificans traumatica.

The case under consideration is of the third type, localized myositis ossificans. It resembles closely the cases of myositis ossificans traumatica reported by Coley, Jones, Finney, Kidner, and others, but it differs from the usual cases reported in that a history of trauma is lacking, whereas trauma is usually prominent

*From the Division of Surgery, Mayo Clinic, Rochester, Minn. Submitted for publication December 2, 1926.

in the history, and the patient was a female, whereas males are usually affected.

The condition is probably the result of an injury to the periosteum and muscle with associated hemorrhage. The injury to the periosteum and bone liberates osteoblasts which find their way into the muscle through the extravasated blood. The osteoblasts evidently develop bone within the muscle. A history of trauma was lacking in this case, but there was most likely a slight injury that the patient did not notice.

The differential diagnosis is important because of the danger of confusing the condition with sarcoma. In the first few weeks the processes cannot be distinguished except by biopsy; it was the questionable diagnosis which prompted exploration in this case. Coley distinguishes the two conditions essentially as follows:

Myositis ossificans after its initial growth tends to regress, whereas progression is evident in sarcoma in time. On palpation the tumor of myositis ossificans is uniformly hard, whereas the tumor produced by sarcoma is not so uniform in its resistance to pressure. Early pain is characteristic of the benign lesion while it is rare in the malignant process; nearby joints are disabled early in myositis ossificans but only late in sarcoma, and if the disease has progressed so that definite changes may be seen roentgenographically the shadow cast by the former is more regular in outline than that of the latter.

Conservative treatment, I believe, is indicated if the diagnosis is reasonably certain. Rest in the stage of progression, then local heat, massage, and active motion to aid regression should be carried out. Surgery should be reserved for cases in which there is a residual disturbance of joint function. Early exploration in this case was mainly for the purpose of establishing a diagnosis.

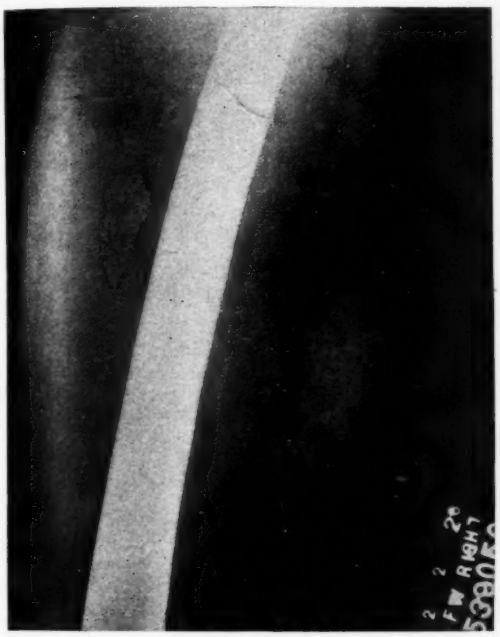


Fig. 1. Region of increased density in the muscles anterior to the femur.

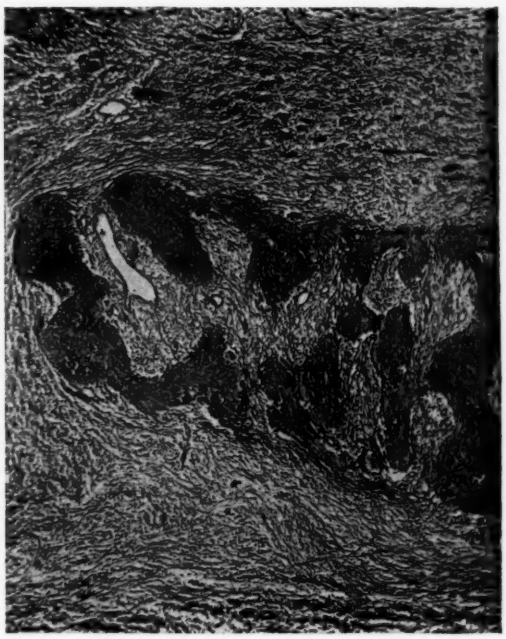


Fig. 2. Section of tissue removed at operation (x60), stratum of spongy bone, osteoblasts lining spicule of bone, and zone of disintegrating striated muscle with fibrosis.

BIBLIOGRAPHY

1. Coley, W. B.: Myositis ossificans traumatica. Ann. Surg., 1913, lvii, 305-337.
2. Finney, J. M. T.: Myositis ossificans traumatica. South. Surg. and Gynec., Tr., 1909, xxii, 85-106.
3. Jones, Robert, and Morgan, David: On osseous formations in muscles due to injury. Arch. Roentg. Ray, 1905-1906, ix, 245, and x, 10-11; 72-73; 99-100.
4. Kidner, F. C.: Calcified hematoma. Jour. Am. Med. Assn., 1917, lxviii, 177-180.
5. Noble, T. P.: Myositis ossificans: a clinical and radiological study. Surg., Gynec., and Obst., 1924, xxxix, 795-802.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

REPORT OF THE DEPARTMENT OF HEALTH OF THE CITY OF CHICAGO FOR THE YEARS 1923, 1924 AND 1925. Herman N. Bundesen, M.D., Commissioner of Health, Chicago. 842 pages. Illus. Chicago: Igoe Press, 1926.

ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE OF THE UNITED STATES FOR THE FISCAL YEAR 1926. 330 pages. Illus. Washington: Government Printing Office, 1926.

INTERNATIONAL CLINICS. Vol. IV. 36th Series. Henry W. Cattell, M.D., Editor. 308 pages. Illus. Philadelphia and London: J. B. Lippincott Co., 1926.

TRANSFUSION OF BLOOD. Henry M. Feinblatte, M.D., Assistant Professor of Medicine, Long Island Medical College, Brooklyn, N. Y.; author of "Clinical Laboratory Medicine." 137 pages. Illus. New York: The MacMillan Company, 1926.

THE DOCTOR LOOKS AT LOVE AND LIFE.

Joseph Collins, M.D. 279 pages. New York: George H. Doran Company, 1926. Price $3.00.

This book will be of unusual interest to the physician because it is written by one of his own profession, a man who has practiced medicine for a third of a century, first as a general practitioner and later as a world renowned neurologist who at the same time had the ability and inclination to become a well known author with several non-medical books to his credit. The first half of the work, indicated in the title as "The Doctor Looks at Love," is a sane, frank, interesting discussion of the old but ever fascinating subject of sex, given in the clear, simple language of a man who is a logical thinker and who has the ability to express himself easily and clearly. As remedies for many of the evils of the day, he advocates earlier marriages and education of children upon the subject of sex. His general attitude toward the whole subject is well expressed when he says, "That the joys of the world are circumscribed by sexuality is an exaggeration and a falsehood. Sexuality sweetens life but it is not what makes life worth living."

The second half of the book, indicated as "The Doctor Looks at Life," consists of five separate essays on different subjects, bearing no connection to each other. The first is entitled "Adult-Infantilism" and is discussed in three aspects: in a nation, the U. S. A.; in the individual, with William Jennings Bryan as an example; and in literature. He indicates adult-infantilism not as a failure of the individual to grow and develop mentally but instead to carry over into adult life, to meet the problems of living, only childish mental traits and reactions.

The second essay, "Voices Crying in the Wilderness," is a treatise upon the intolerance existing in our country today, in which he says, "We have American tradition and American ideals upon our lips but graved upon our hearts is prejudice, intolerance and bigotry."

The third essay, "Do Characters in Fiction Behave Like Human Beings?" is a discussion of well known characters of fiction and he concludes that, as a general rule, authors give us real and human characters.

The fourth, "The Fundamentalists and Modernists of Psychology," is devoted to Freud and his doctrine. The author's disagreement with the well known psychologist becomes very apparent when he says, "One of the reasons why it has had such popularity and general interest in this country is because it allows sexually repressed individuals and puritanism-steeped people to talk frankly of things which would otherwise be considered shocking. It makes a science of obscenity. He tempers his criticism, to a certain extent, however, when he says, "Though we cannot accept the Freudian psychology neither can we reject it en masse. We are in the position of the man who needs a suit of clothes and has found one. He cannot wear it without looking ludicrous and contemptible. But he can have it made over, in fact he can make it over himself."

The fifth and last is devoted to "Adult Education and Libraries." and holds the most of academic interest in the group. The author says, "There is more universal education and less culture in the United States than in any enlightened country in the world" also "If anything, save love, can make us see our neighbor's eye without a beam, it is knowledge obtained through education. Most people do not want to think; they find it disagreeable and exhausting. They want to do things which will prevent them from thinking." He then says, "Anyone may acquire education if he makes proper use of his leisure time" and everyone should do this because "Education develops a sort of vitality by making life interesting and worth-while, it has another function: to develop sympathy and open-mindedness." He then discusses libraries and says, "Libraries, like hospitals, are made by their staffs, not by their buildings, their books or their beds."

This book, written by a clear thinking physician, with literary ability added to the keen insight and broad sympathy developed by years of practice in his chosen profession, should have a place, not on the physician's library shelves, but on his desk, where it may be frequently referred to and slowly read with deep thought and meditation. It will contribute to his general education and breadth of vision, not by teaching him something really new but by crystallizing half formed thoughts and stimulating clear thinking concerning the fundamentals of life. Not many of us have the time to become educated along non-medical lines but we may all make a start in the right direction by reading "A Doctor Looks at Love and Life" and making it a part of our mental equipment as well as of our libraries.

MARGARET WARWICK, M.D.

COLLECTED PAPERS OF THE MAYO CLINIC AND MAYO FOUNDATION, Rochester, Minnesota. Octavo of 1078 pages, 252 illustrations. Cloth, $13.00 net. Philadelphia and London: W. B. Saunders Company, 1926.

The contents of the volume this year seems to show again the interesting and enormous amount of work which is being done at the Mayo Clinic. The compilers have, as usual, divided the volume into various departments, as follows:

1. ALIMENTARY TRACT.

Here are included many papers taking in order the various diseases of the alimentary tract. Two papers open the section, *i.e.*, Pharango-esophageal Diverticula and Epigastric Pain as a symptom of esophageal obstruction. The stomach is discussed, particularly ulcer, both from the medical and surgical standpoint. One very interesting paper is on Primary Carcinoma of the Duodenum.

Papers on gallbladder include many studies on the functional tests of the liver, the physiology of the liver and cholecystography besides the medical and surgical aspects of cholecystic disease.

The colon is considered as to amebiasis, colitis and carcinoma, and the section closes with a technical paper on the removal of hemorrhoids.

2. UROGENITAL ORGANS.

This division includes papers on the kidney, as to *x*-ray findings, transplantation, diuretics and tumor formation.

The prostatic studies include benign hypertrophy, carcinoma and treatment for same. Treatment of carcinoma of the uterus is also concident.

3. DUCTLESS GLANDS.

Here thyroid disease is discussed most fully from all aspects. Four other papers, one on tetany and one on diabetes, are also included in the section.

4. BLOOD AND CIRCULATORY ORGANS.

Heart disease is discussed, *per se*, also its relation to other diseases. Ramisection and ganglionectomy are fully discussed. Hypertension, polycythemia vera and puerpera are other papers included here.

5. SKIN AND SYPHILIS.

The treatment of various skin diseases is considered, together with studies on syphilis, malaria treatment and spinal fluid findings.

6. HEAD, TRUNK AND EXTREMITIES.

This section is devoted to various methods of treatment of the different diseases of the head and neck, sinuses, ear and nose. Tumors of the head and neck are considered. There are also interesting papers on dislocation of the shoulder (bilateral), ununited fractures and bone tumors.

7. CHEST.

There are four papers here considering the diagnosis and study of certain types of chest disease.

8. BRAIN, SPINAL CORD AND NERVES.

Epidemic hiccup is ably discussed in this section. Other papers include ketogenic diet in epilepsy, surgical treatment of facial paralysis and tumors of the spinal cord.

A short section on "Technic" gives certain interesting papers on types of anesthesia; one on insulin and, the last, The Pilcher Bag as a means of securing hemostasis in suprapubic prostatectomy.

The last section is composed of a group of miscellaneous papers which were given throughout the year on various aspects of medicine. Some of the papers are more or less general in nature while others hold to a specific question. The whole volume is a beautiful and worthy contribution to medical science and is highly recommended.

A. E. CARDLE, M.D.

DISEASES OF THE BRONCHI, LUNG AND PLEURA. Frederick T. Lord, M.D. 2nd edition revised and enlarged. 776 pages. Illus. Cloth, $8.00. Philadelphia: Lea & Febiger, 1925.

This textbook is divided into three parts treating with Diseases of the Bronchi, Lung and Pleura, respectively. The author discusses quite completely the various types of Bronchostenosis from the standpoints of etiology, diagnosis and treatment. The chapter dealing with Pulmonary Tuberculosis is extensive and instructive, being replete with up to date information concerning diagnosis and management.

Lobar Pneumonia is given a good deal of space with a full discussion of the various situations which arise in the management of the disease.

Rare types of parasitic lung affections are described in sufficient detail.

Part III deals with Pleuritis and its various manifestations including a thorough discussion of Purulent Pleuritis.

The book as a whole embodies concise and logical consideration of these three important subjects. Its style and arrangement are so agreeable that one reads with pleasure and at the same time feels that he is obtaining valuable help from the author.

L. R. CRITCHFIELD, M.D.

YOUNG'S PRACTICE OF UROLOGY. Based on a study of 12,500 cases. Hugh H. Young, M.D., and David M. Davis, M.D., Johns Hopkins University, with the collaboration of Franklin P. Johnson. Two volumes, 1,484 pages, 1,003 illustrations. Cloth $25.00 net per set. Philadelphia: W. B. Saunders Co., 1926.

This well written, extensive, and beautifully published work on urology has a number of unusual characteristics to favor it. Although all subjects are adequately represented and the literature well covered, still the greatest space is devoted (1) to the clinical experiences with 12,500 cases treated by the authors and at the Brady Urological Institute; and (2) to the various procedures, mechanical devices, and original researches which have had their inception with the authors. To quote from the preface: "We perhaps should apologize for having devoted so much space to this personal work, but, as mentioned before, our interpretation of the reason for the lasting value of many old medical books, that are still full of interest after a lapse of many years, is their individual character and their detailed description of personal experiences and inventions. 'By their fruits ye shall know them.'"

The arrangement of the subject matter, almost entirely on the basis of pathology and etiology, is particularly interesting to the reviewer, reminding him strongly of the arrangement of subjects in McCallum's "Textbook of Pathology." This plan of arrangement is a peculiarly happy one. For instance, all lesions produced by obstruction of the urinary tract are considered together. It is also noted that, to avoid repetitions, all operations on the urogenital tract are described in one section of the book.

There are more than 1,000 fine illustrations,—colored plates, photomicrographs, roentgenograms, and drawings by William P. Didusch.

We feel that "Young's Practice of Urology" will live for many years as one of the great works in its field.

THEODORE H. SWEETSER, M.D.

THE DUODENAL TUBE AND ITS POSSIBILITIES. Max Einhorn, M.D., Professor of Medicine at the New York Postgraduate Medical School; Visiting Physician to the Lenox Hill Hospital, New York. Second Edition, Revised and Enlarged. Illustrated. Philadelphia: F. A. Davis Company, 1926.

A very interesting treatise of 200 pages, giving the development of the duodenal and stomach tubes, with all the later developments of the intestinal tubes, pyloric dilators, delineators and other instruments for gastro-intestinal study. This book is profusely illustrated with diagrams, *x*-ray plates and numerous case reports, which make it easier for the physician to determine the indications for the various instrumentations.

The book is easily read, and for the progressive physician opens up an interesting field which is of benefit, diagnostically, and therapeutically.

A. N. BESSESEN, JR., M.D.

WANTED—Position as physiotherapist in a Minnesota hospital. Have had experience at the Battle Creek Sanitarium and in the Vancouver General Hospital. Part time with one or more hospitals agreeable. M.D. Address C-111, care MINNESOTA MEDICINE.

WANTED—Salaried appointments for Class A physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

WANTED—Physician to share nicely furnished offices in Lowry Building. $30.00 per month, including gas, electricity and telephone. Address C-110, care MINNESOTA MEDICINE.

LOCUM TENENS wanted for March. Two or three weeks. University of Minnesota graduate, finished internship. Address C-108, care MINNESOTA MEDICINE.

LOCUM TENENS WANTED from March 15 to July 1. Graduate of Minnesota, class of March, 1927. Address C-109, care MINNESOTA MEDICINE.

DOWNTOWN OFFICE SPACE for rent March first, in Minneapolis, with 4 doctors, 1 dentist, 1 stenographer and 1 *x*-ray technician. Address C-113, care MINNESOTA MEDICINE.

DOCTOR WANTED—Scandinavian preferred. Good location. Reasonable rent. Share reception room with dentist. Write C. C. Gerber, 961 Arcade St., St. Paul, or telephone Tower 7340.

REGISTERED NURSE wishes position as doctor's assistant or in institutional work. Prefer St. Paul or vicinity. Address C-112, care MINNESOTA MEDICINE.

WANTED—Eye, ear, nose and throat man and internist to become associated with a group of physicians. New clinical building. X-ray and clinical laboratories fully equipped. Will give free office expense until established. Address C-107, care MINNESOTA MEDICINE.

WANTED—Physician and Surgeon as partner in good paying practice. Complete equipment including X-ray. Excellent territory. Prefer a man about thirty years of age. For details write to L. M. Davies, 2103 Harriet Ave., Apt. 103, Minneapolis, Minn.